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A
HAND-BOOK
OF
MATERIA MEDICA
AND
THERAPEUTICS.



Second Edition

A
H A N D - B O O K
O F
M A T E R I A M E D I C A
A N D
T H E R A P E U T I C S :
W i t h T w e n t y - n i n e I l l u s t r a t i o n s .
B E I N G A P O R T I O N O F
A N A N A L Y T I C A L C O M P E N D I U M
O F T H E
V A R I O U S B R A N C H E S O F M E D I C I N E .

B Y
J O H N N E I L L , M . D . ,
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S E C O N D E D I T I O N , R E V I S E D A N D I M P R O V E D .

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MATERIA MEDICA.

MEDICINES are substances which have the power of so modifying the actual state of the organs—the solids and fluids,—as to render them applicable to the cure of disease. They differ from *remedies*, which are of a more generic nature, and which include all the various means—moral as well as physical—employed to alleviate or cure disease: thus heat, cold, electricity, a surgical operation, the influence of the emotions, &c., are all remedies, but cannot be called medicines.

MATERIA MEDICA is the science which treats of medicinal substances; THERAPEUTICS—the application of remedies to the treatment of disease; PHARMACY is the art of compounding or preparing medicines for use; TOXICOLOGY embraces the consideration of their *poisonous* effects.

A complete knowledge of medicines includes an acquaintance with their *physical characters*, such as of colour, taste, odour, general appearance; their *chemical properties*; their *natural and botanical history*; their *modes of growth, collection, preservation, &c.*; their *therapeutical applications*; their *physiological properties*, or their method of affecting the healthy system; and their *toxicological properties*, or their poisonous effects. It is hence obvious that a correct knowledge of Materia Medica presupposes some acquaintance with Natural History, Botany, and Chemistry; and that of Therapeutics requires some familiarity with Anatomy and Physiology, and also with the principles of Mental and Moral Philosophy, as well as of the general powers or forces of nature, such as light, heat, electricity, and magnetism.

Along with medicines proper, it is usual to consider a set of substances called *aliments*, which are often very useful as therapeutic agents, though they cannot be considered as *medicinal* in their action. They possess nutritive qualities, and when swallowed, they are digested and converted into chyle. Medicines, on the contrary, produce their effects upon the system, not by undergoing change through the digestive process, and becoming thereby *assimilated*, but either by being absorbed into the circulation, and thus influencing the blood and the various secretions by virtue of some

chemical influence, or by means of nervous communication between distant parts and the part to which the remedy is immediately applied.

EFFECTS OF MEDICINES.

The effects of medicines vary very considerably; they may conveniently be divided into *primary*, or those which are more immediately apparent; and *secondary*, or those which follow the primary as a consequence; the latter are sometimes termed the *remote* effects of medicines, and, as these are generally aimed at in the treatment of disease, the *therapeutical effects*. An example or two will best illustrate this difference: the primary effect of a cathartic is to empty the bowels; one of its secondary effects is to deplete from the circulation; hence we employ purgatives in fevers and inflammations. The primary operation of a diuretic is to increase the secretion of urine; a secondary effect is to promote absorption; hence it proves beneficial in dropsy. In fact, medicines are rarely used, comparatively speaking, for their primary effects, but almost always for their secondary operations. In some cases, however, the two are not distinct, the primary becoming the therapeutical effect, —as the action of digitalis on the heart, or that of opium in relieving pain.

As the effects of medicines upon the system are not absolute, but relative, and influenced by various circumstances, it follows that no remedy can be regarded essentially as a *specific*, since what might be applicable to the disease under one condition, might be equally injurious under a different one.

The primary effects of medicines may take place in three ways: 1, *locally*; 2, *by being absorbed*; 3, *by means of nervous communication*.

1. The *local action* of medicines requires no explanation; it is that which occurs in the part to which the medicine is immediately applied, as vesication from a blister, vomiting from an irritant applied to the stomach, &c.

2. As regards the *absorption of medicines into the blood*, there is abundant proof of the fact, since they have been detected, after being swallowed, in the different secretions, in the solid tissues of the body, and in the blood itself. Thus rhubarb and turpentine have been found in the urine; garlic in the exhalation from the lungs; sulphur and mercury in the perspiration; garlic, various purgatives, narcotics, and other medicines in the milk; and so on.

As regards the *method* by which medicines gain admission into the blood, there can be but two avenues—the lacteals or absorbents, and the veins. From various experiments made upon the lacteals, it is highly probable that their chief, if not exclusive function, is to take up *alimentary* substances—such as can be converted into chyle:

medicinal substances were very seldom found in them. On the other hand, experiments are equally strong in proving, that the *veins* are chiefly concerned in the absorption of medicinal substances; thus Magendie found that if the lacteals be tied, *nux vomica* will affect an animal in six minutes, while, if the veins be tied, no effect is produced. The mode by which absorption is effected is entirely physical, or by *endosmose*. The *rapidity* of absorption is influenced by a variety of circumstances, as the part or tissue to which the medicine is applied, the nature of the medicine itself, chiefly as regards its *solubility*, the condition of the system, &c. It is said to be the greatest from the bronchial mucous membrane.

3. *Action of medicines by means of nervous communication, or sympathy.* As the different parts of the system are intimately connected together by nervous communication, it follows that any abnormal impression—whether by disease, or by a medicinal agent—made upon one part, will influence others more remote; thus, the influence of opium, or alcohol, felt upon the nervous expansion in the stomach, is immediately communicated to the brain through the nervous cords. In some cases the impression is conveyed *directly* from one organ to another; in others, *indirectly*, through the intervention of the cerebro-spinal axis; the latter is termed *reflex action*. Generally, however, the operation of medicines is of a compound nature, depending both upon the circulation and nervous communication.

Medicines may be said to affect the system in three ways,—*physically* or *mechanically*, *chemically*, and *vitally* or *dynamically*.

Instances of the *mechanical* action of medicines are afforded in the case of many of the anthelmintics, which expel worms from the bowels simply by the mechanical irritation produced; also in the case of bran, which is believed to act as a laxative in a similar manner; and metallic mercury has been employed to overcome intro-susception of the bowels, by virtue of its gravity.

As regards the *chemical* action of medicines, there is every reason to believe that remedies obey the same chemical laws in the living body as they do out of it. We can actually see it in the case of caustics, whose action upon the skin is purely chemical; an excess of acid in the stomach and bowels, and even in the blood, is corrected by the use of alkalies—a strictly chemical action. Many other examples might be cited. Indeed it is highly probable, from the very complex character of the blood, and its consequent facility of decomposition, that most of the medicines which enter the circulation act by *chemically changing its character*, and chiefly, through its proteine principles, albumen, &c.

Medicines are, however, not to be considered as confined in their effects, to any single one of the above methods. They frequently partake of a mixed character, as chemico-vital or physico-vital.

Certain medicines have been found to evince a natural preference for certain organs; thus, an emetic for the stomach, a cathartic for the bowels, &c.; and this, too, no matter in what way the medicine be introduced into the system; thus tartar emetic or emetia will vomit even if injected into the blood-vessels. No satisfactory explanation can be given of this; we can only ascribe it to a *natural affinity* supposed to exist between the medicine and the particular part; but this is obviously no explanation of the phenomenon.

Again, medicines are sometimes regarded as divisible into two opposite classes—*stimulants* and *sedatives*. This, however, cannot strictly be affirmed, since different states of the system may produce quite opposite results from the same medicine. This is well illustrated in the effects of the too long-continued use of tonics and stimulants; the result is debility.

CIRCUMSTANCES MODIFYING THE ACTION OF MEDICINES.

There are various circumstances which modify the action of medicines upon the system; these may depend upon the medicine itself, as respects its dose, mode of combination, &c., or upon the condition of the organism at the time of its administration. Under the latter head, the most important circumstances are:—

1. AGE.—The young are much more susceptible to the action of medicines than the middle-aged. Old persons are less able to bear an overdose than the middle-aged. It is difficult to lay down any precise rule upon the subject: that of Dr. Young is often adopted; it is “to diminish the dose of most medicines, for children under 12 years, in the proportion of the age to the age increased by 12;” thus at 2 years it would be $\frac{2}{2+12} = \frac{1}{7}$, &c. At 21, the full dose may be given. There are certain medicines, however, which cannot be given to young children according to the above rule; thus calomel and castor oil require to be given in larger proportionate doses; whilst the narcotics, and some of the metallic preparations, must be administered in much smaller proportionate quantities.

2. SEX.—Females, as a general rule, require smaller doses than males. The peculiarities of their system, at the different periods of menstruation, pregnancy, and lactation, must also be borne in mind.

3. HABIT.—The effect of habit, in accustoming to the action of a medicine, is well known; it is well illustrated in the case of alcohol and opium. The influence of acrid or irritating substances is but little diminished by repetition.

4. DISEASED CONDITION OF THE BODY.—This is well seen in the power of the system to bear very large doses of opium in tetanus and mania-a-potu, and of the different effects of calomel in different conditions of the system.

5. TEMPERAMENT AND IDIOSYNCRASY will also modify the action of medicines. These should always be ascertained in the administration of our remedies.

6. TISSUE, OR ORGAN.—The stomach is much more susceptible than the skin; carbonic acid, when inhaled into the lungs, acts as a poison; when swallowed into the stomach, it merely proves a grateful stimulant.

7. THE TIME OF ADMINISTRATION also exercises an influence; a medicine acts more promptly and powerfully on an empty stomach.

8. MENTAL EMOTIONS.

ADMINISTRATION OF MEDICINES.

Under this head may be included the parts to which medicines are applied, with the mode of their application, and the forms in which they are employed.

The parts of the body to which medicines are most usually applied, are the stomach, rectum, skin, mucous membrane of the lungs, nostrils, vagina, bladder, and urethra.

The *stomach* is most frequently resorted to, both on account of the facility of administration through it, its great susceptibility, and its intimate relation with other parts.

The *rectum* is employed, where the patient cannot swallow the medicine, or where there is some objection for giving it by the mouth, or when a local impression is desirable. Medicines thus employed are called *enemata*, or *clysters*, or *injections*. If introduced in the solid state, they are named *suppositories*. The dose of the medicine, as a general rule, is three times that given by the stomach, though there are exceptions. When intended to be retained so as to impress the system, the *bulk* of the vehicle should be as small as possible.

The *skin* is frequently made use of as a means of affecting the system by remedies. These may be applied either *epidermically* or *endermically*,—that is, to the sound skin, or to the skin deprived of its cuticle. The endermic method is by far the most prompt and powerful. The cuticle is best removed by means of a small blister: and the proper parts for the application are the epigastrium, and the insides of the limbs. The usual dose is three times the quantity given by the mouth; and the powdered substance should be properly diluted, before being sprinkled upon the denuded surface. The circumstances which may demand the endermic method of administration are inability or indisposition of the patient to swallow, or of the stomach to retain the medicine; inflammation of the gastric mucous membrane, or a want of susceptibility of this part to the action of the medicine, from frequent repetition; the necessity, in urgent cases, of introducing medicines in all possible modes; the

indication that may exist to produce revulsion from internal parts; and the necessity for procuring the local effects of the remedy.

When the cuticle is not removed, the medicines may be applied in various manners; thus, where their local effects alone are wanted—by lotions, fomentations, cataplasms, &c.; where their general impression is desired—by inunction, baths, and vapour. The most simple form of administering a vapour bath, is to elevate the patient's knees under the bedclothes, and to place at his feet hot bricks enveloped in wet flannels; the vapour which is given off has thus free access to the body. Another method is to place the patient in a tub of warm water, enveloping him in a blanket, after which a number of hot bricks are to be placed in the tub, until the requisite amount of steam is generated. Another method, recommended by Dr. Serres, is to place a piece of quick lime in a wet cloth, and then wrap it up in a dry cloth, and place it in the bed. If the vapour of a solid substance, as sulphur, is required, the patient is to be placed in a properly-contrived apparatus, and the solid body sprinkled in powder on a hot iron at his feet.

The *mucous membrane of the bronchi* may also be employed for the introduction of medicines. They are applied here usually in the form of vapour, by means of an inhaler; or, when this cannot be had, by means of a teapot or basin, with an inverted funnel. It is not recommended to blow fine powders into the lungs.

Occasionally, medicines are introduced through the *nasal or pituitary membrane*; they are however employed, in this manner, generally with a view to their local impression. When they produce a discharge, they are called *errhines*; when sneezing, *sternutatories*.

The practice of *introducing medicinal substances through the veins* has been occasionally resorted to; but it is not recommended, in consequence of the danger of the introduction of air, which is attended with fatal consequences.

FORMS OF MEDICINES.

Medicines are used in the solid or fluid state, each of which comprises several forms.

I. SOLID FORMS.

These include *pills, powders, confections, troches, electuaries, and extracts*.

PILLS. (*Pilulæ*, U. S.)—Small globular masses, intended to be swallowed without chewing; they should not consist of substances requiring to be given in large doses, nor of salts which are deliquescent or efflorescent, although the latter may be rendered fit by first driving off the water of crystallization by heat. Some substances require only the addition of water; others, the intervention of some

viseid body, as gum or sugar. The heavy metallic powders may be mixed with soft extracts or confections; the light vegetable powders, with syrup, honey, or mucilage. When the requisite consistence has been given to the mass, it is to be properly rolled out by means of a spatula, and then divided into the requisite number of pills. Sometimes they are covered with gelatine, to conceal their disagreeable taste.

POWDERS. (*Pulveres*, U. S.)—Such medicines are given in the form of powder as are not very bulky, nor of very disagreeable taste, and have no corrosive property. Deliquescent substances, and those containing much fixed oil, are unfit to be used in powder; as also such crystalline salts as contain water of crystallization, unless this be previously expelled by heat. The substance may be reduced to the state of powder by means of a mortar and pestle, made either of metal, glass, or Wedgwood. The coarser particles are separated by sieves made of various materials. Some require to be submitted to the processes of *levigation* and *trituration*. By the former of these terms is meant the rubbing of the substance, previously moistened, between two smooth pieces of hard flat stone; the latter term signifies the agitation of the matter in water, allowing the coarser particles to settle, pouring off the liquor for the finer ones to subside, and lastly, decanting and drying the powder. Some medicines deteriorate when kept in the powdered state. They are also more liable to adulteration.

The lighter powders may be administered suspended in water, or any other convenient vehicle: the heavy insoluble ones, in syrup, molasses, or honey.

TROCHES. (*Trochisci*, U. S.)—Small solid masses, in which the medicinal substance is incorporated with the sugar and gum,—intended to be held in the mouth and allowed slowly to dissolve. They are used chiefly in affections of the throat.

CONFECTIONS. (*Confectiones*, U. S.)—Soft solids, made by incorporating medicinal substances with sugar: they comprise also *conserves*.

ELECTUARIES. (*Electuaria*.)—Usually extemporaneous prescriptions, made by mixing medicines (generally powders) with honey or molasses.

EXTRACTS. (*Extracta*, U. S.)—These are either solid or fluid. The former are usually prepared by evaporating either the expressed juice, or the infusion or decoction; the latter, by the addition of sugar to the concentrated infusion, decoction, or tincture.

II. LIQUID FORMS.

These include *decoctions*, *infusions*, *solutions*, *medicated waters*, *mixtures*, *tinctures*, *wines*, *spirits*, *ethers*, *oils*, *syrups*, *vinegars*, *oxymels*, and *honeys*.

DECOCTIONS. (*Decocta*, U. S.)—Preparations in which the active properties of vegetables are extracted by boiling. The boiling should take place in a covered vessel. Certain vegetables are unfit for decoction, as those which possess a volatile oil, or such as contain much inert, starchy, or mucilaginous matter.

INFUSIONS. (*Infusa*, U. S.)—These differ from decoctions in not being boiled. They may be made either with cold or boiling water. Cold water is preferred where the active principle is volatile, or easily injured by heat, or where it is desirable to avoid the solution of some principle which is insoluble at a low temperature. Both infusions and decoctions usually require to be *filtered*; this process may be performed either by using unsized paper in a common funnel, or by *percolation* or *displacement*.

SOLUTIONS. (*Liquores*, U. S.)—Preparations in which substances are simply dissolved in water; as *liquor calcis* or *lime-water*.

MEDICATED WATERS. (*Aquæ Medicatæ*, U. S.)—These are water impregnated with different essential oils; they are usually made by first rubbing up the oil with carbonate of magnesia, and then adding the water, and filtering.

MIXTURES. (*Misturæ*, U. S.)—These consist generally of one or more insoluble substances, suspended in water by means of gum, sugar, or yolk of egg. When an oil is suspended in this way, the mixture is called an *emulsion*. A good deal of care and dexterity are requisite in making a uniform mixture.

TINCTURES. (*Tincturæ*, U. S.)—Solutions of medicated substances in alcohol, or diluted alcohol. They are usually macerated, at ordinary temperatures, in well-stopped bottles, frequently agitating. *Undiluted* (official) alcohol is employed where the substance to be dissolved is insoluble in water,—as resins, essential oils, &c.; but *diluted* alcohol is preferred when the substance is soluble both in alcohol and water.

WINES. (*Vina*, U. S.)—Are solutions in wine. The only wines proper for use are Madeira, Sherry, or Teneriffe.

SPIRITS. (*Spiritus*, U. S.)—These are alcoholic solutions of volatile principles, and are prepared either by distillation, solution, or by maceration.

ETHERS. (*Ætheræa*, U. S.)—These require the action of acids on alcohol.

OILS.—The *distilled oils* (*Olea Destillata*, U. S.) are prepared by distillation from the substances containing them. The *fixed oils* (*Olea Fixa*), by expression; as *olive oil*, &c.

SYRUPS. (*Syrupi*, U. S.)—Preparations in which the medicinal substance is preserved in a concentrated solution of sugar. *Simple syrup* consists of two and a half pounds of white sugar dissolved in a pint of water. *Medicated* syrups are made either by adding the proper amount of sugar to vegetable infusions, decoctions, juices,

&c., or by adding the tincture of the substance to simple syrup, and afterwards driving off the alcohol by the heat of a sand bath.

HONEYS. (*Mellita*, U. S.)—These are analogous to syrups, the difference being that honey is employed to preserve the medical substance, instead of a solution of sugar. They are said to be less apt to become candied.

OXYMELS are preparations in which honey and vinegar are combined.

VINEGARS. (*Aceta*, U. S.)—Liquids in which distilled vinegar is employed as the solvent.

Besides the above forms of medicines, which are employed for internal administration, there are several others which are used exclusively as external applications; these are *liniments*, *ointments*, *cerates*, *plasters*, and *cataplasms*.

LINIMENTS. (*Linimenta*, U. S.)—Oily compounds intended to be applied to the surface by bathing, or by saturating cloths with them.

OINTMENTS. (*Unguenta*, U. S.)—Soft solids which melt at the temperature of the body.

CERATES. (*Cerata*, U. S.)—These are rather harder than ointments: they do not melt at the temperature of the body. *Simple cerate* consists of fresh lard and white wax.

PLASTERS. (*Emplastra*, U. S.)—These are solid at ordinary temperatures, and require to be heated before they can be spread. They are usually kept in rolls, and when wanted for use are spread upon sheepskin, linen, muslin, or even paper; a small margin being left at the edges uncovered.

CATAPLASMS or POULTICES.—These are soft moist preparations, intended to relax and soften the parts to which they are applied. They are usually made from bread and milk, flaxseed meal, &c.

The *weights* and *measures* recognised by the Pharmacopœia in the compounding and dispensing of medicines are the *Apothecaries' weight*, and the *Apothecaries' or wine measure*, though medicines are purchased and sold by the wholesale dealer by the *Avoirdupois weight*. The imperial pint of the British Pharmacopœia (not recognised by the U. S. Pharmacopœia), contains *twenty* fluid ounces. The common pint contains only *sixteen* ounces.

The following are the denominations, together with their symbols, which are employed in prescription:—

Pound, lb; ounce, ℥; drachm, ℥; scruple, ℥; grain, gr.; gallon, Cong. (congerius); pint, O (octarius); fluid ounce, f ℥; fluid drachm, f ℥; minim, ℥.

A *drop* is not always equivalent to a minim, since it varies in size according to the nature of the fluid, and the shape and size of the vessel from which it is dropped. In the case of water, the minim and drop are the same; in alcohol there are two drops in each minim; in ether, there is a still greater difference. *Chloroform* contains from 250 to 300 drops in a fluid drachm.

Besides the above weights and measures, it is frequently found convenient to employ *approximative* measurements, in prescribing medicines. The following are the most common :

| | | |
|--|------------|---------------------|
| A <i>teacup</i> ,—estimated to hold about four fluid ounces, | (f 3iv.) | or a gill. |
| A <i>wineglass</i> , “ “ two fluid ounces, | - (f 3ij.) | |
| A <i>tablespoon</i> (cochlear magnum), - - - | - (f 3ss.) | half a fluid ounce. |
| A <i>teaspoon</i> (cochlear parvum), - - - | - (f 3j.) | a fluid drachm. |

CLASSIFICATION OF MEDICINES.

The great diversity of the effects of different medicines, renders an attempt at their classification very desirable. Classifications of medicines may be divided into *empirical* and *rational* ones. As an example of an empirical classification, the *alphabetical* order may be cited, since this method is founded on names which are arbitrary, and have no relation to the bodies which they are intended to represent. All its supposed advantages—as, for example, that of facility of reference—may be obtained from a well-constructed index.

The *rational* arrangements are such as have an actual relation with the bodies for which they are used, being founded on the properties of the medicines themselves, or on their mode of affecting the economy. Thus medicines may be grouped, according to (1) their *sensible* properties, as colour, taste, and smell; (2) their *chemical* properties; (3) their *natural-historical* properties; (4) their *therapeutical* properties; (5) their *physiological* properties.

Valid objections may be urged against all the above systems of arrangement, with the exception of the *physiological* system, which is here adopted, as being the safest guide both to the student and practitioner.

By the *physiological classification* is meant one founded on the relation which medicines bear to the system in a state of health. Medicines may be arranged *physiologically*, on two principles;—according to the parts or organs which they affect, or according to the nature or quality of the action which they set up. It would be almost impossible to base an arrangement exclusively upon either of these methods; but some authors form their principal divisions or *classes* of medicines from the parts acted on, and their *orders* from the nature or quality of the effect, or *vice versâ*. The following system of classification is founded upon the *physiological* method.

Medicines may be considered as acting either upon the solids and fluids of the body, or upon foreign matters contained in the body. This affords the grounds for their primary division into two separate classes: most medicinal substances belong to the former class.

Of those medicines which act upon the solids and fluids of the body, some may exert their influence upon the system at large, either through the medium of the circulation or that of the nervous

system; whilst others confine their operation to some especial organ, as the kidneys, the lungs, the skin, &c.: the former are termed *general remedies*; the latter, *local remedies*.

General remedies are divisible into three orders: stimulants, which elevate the system above the natural standard; *sedatives*, which depress it below the natural standard; and *alteratives*, which act by slowly changing the nutrition, and thereby superseding diseased action.

Stimulants may be divided into *permanent stimulants* and *diffusible stimulants*; the former include the two ultimate classes of *astringents*, or medicines which excite the vital contractility of the tissues; and *tonics*, which increase the vital tonicity of the system. Diffusible stimulants include the two divisions of *arterial stimulants* and *cerebro-nervous stimulants*. The latter are divided into *cerebral stimulants*, or *stimulant narcotics*; *nervous stimulants*, or *antispasmodics*; and *excito-motor stimulants*, or such as affect the spinal centres so as especially to excite the motor nerves.

Sedatives comprise only the two ultimate classes of *arterial sedatives*, sometimes named *refrigerants*, and *nervous sedatives*, or *sedative narcotics*.

Local remedies are divided into three orders: *those affecting the functions*; *those affecting the organization*; and *those which act mechanically*. The medicines which affect the functions include the eight following classes: *emetics*, which act upon the stomach; *cathartics*, which act upon the intestines; *diuretics*, which increase the secretion of the kidneys; *diaphoretics*, which promote perspiration; *expectorants*, which increase the pulmonary and bronchial secretion, or facilitate its expulsion; *emmenagogues*, which facilitate the menstrual discharge; *sialagogues*, which stimulate the salivary glands; and *errhines*, which increase the secretion of the nasal mucous membrane.

The medicines affecting the organization comprise the three classes of *epispastics*, or such as vesicate or blister the skin; *rubefacients*, or such as inflame the skin; and *escharotics*, or such as destroy the life of the part.

The medicines operating mechanically are the *demulcents*, which act by protecting the surfaces to which they are applied, from irritation; *emollients*, which soften and relax the skin; and *dilutents*, which act by diluting the fluids of the body.

The second great division, embracing substances which act on foreign matters within the body, comprises only two subdivisions: *antacids*, or medicines which neutralize acid in the system; and *anthelmintics*, or such as destroy and expel worms from the alimentary canal.

The following table presents a synopsis of the foregoing arrangement. It is the one adopted by Prof. Wood, and somewhat modified by Prof. Carson.

TABLE OF CLASSIFICATION OF MEDICINES.

I. SUBSTANCES WHICH ACT UPON THE SOLIDS AND FLUIDS OF THE BODY.

| | | | | |
|-------------------|--------------------------|---|---|--|
| General Remedies. | Stimulants, | Permanent, | { Astringents. Tonics. | { Cerebral, Nervous, Excito-motor. |
| | | Diffusible, | { Arterial, Cerebro-nervous, | |
| | Sedatives. | { Arterial, or Refrigerants, Nervous, or Sedative Narcotics. | | |
| | Alteratives. | | | |
| Local Remedies. | Affecting the functions. | { Emetics, Cathartics, Diuretics, Diaphoretics, Expectorants, Emmenagogues, Sialagogues, Errhines. | | |
| | | Affecting the organization. | { Rubefaciants, Epispastics, Escharotics. | |
| | Acting mechanically. | | { Demulcents, Emollicnts, Diluents. | |

II. SUBSTANCES WHICH ACT ON FOREIGN MATTER IN THE BODY.

Antacids,
Anthelmintics.

GENERAL REMEDIES.

CLASS I.

ASTRINGENTS.

“MEDICINES which produce contractility of the living tissues.” This effect is by some ascribed to a *vital* stimulant influence over the organic contractility; others attribute it rather to a *chemical* operation upon the albumen and gelatine of the tissues. Their *general* chemical effect is certainly controlled by vitality; but their *local* chemical operation is much the same as upon dead animal matter.

The obvious effects of astringents are contraction and shrinking of the parts to which they are applied, diminution of secretions, and of hemorrhagic discharges, a harder and fuller pulse, together with greater tonicity of the muscles.

They are used chiefly to arrest morbid discharges, whether hemorrhagic or by secretion; but they should not be prescribed in the early, or inflammatory condition. They are also used in diseases connected with relaxation of the tissues. Among the special disorders calling for their employment are *chronic diarrhœa* and *dysentery*, *passive hemorrhages*, *profuse bronchial discharge*, *catarrh of the bladder*; &c.; and *locally*, in gonorrhœa, leucorrhœa, otitis, ozœna, and ulcers.

They may be conveniently divided into the two classes of Vegetable and Mineral astringents. The former depend for their astringency on a principle common to all of them, named *tannic acid*; the latter possess no such common principle, but each one of them is peculiar in its effects upon the system.

VEGETABLE ASTRINGENTS.

ACIDUM TANNICUM, U. S. (*Tannic Acid*).—Exists in vegetable astringents in combination with *gallic acid*; the latter, indeed, is believed to be produced by the oxidation of tannic acid. It is best obtained by the action of commercial sulphuric ether on powdered galls, allowing it slowly to percolate through them; the water of the ether dissolves out the tannic acid, which may be separated by evaporation.

Prop.—A light porous substance, of a yellowish-white colour; very soluble in water and alcohol, and of a purely astringent taste. There are two varieties, one found in galls, oak-bark, &c., characterized by yielding a *blue-black* precipitate with the persalts of iron; the other found in kino, &c., yielding a *greenish-black* colour. *Incompatibles*,—mineral acids, alkalies, vegetable alkalies, the persalts of iron, and gelatine. It acts on the system as a pure astringent;—useful in diarrhœa and some forms of local hemorrhage. Dose, 3 grs., three or four times a day.

OAK BARK. (*Quercus*).—The officinal varieties of oak bark, are the *Q. alba*, U. S., or *white oak bark*, and *Q. tinctoria*, U. S., or *black oak bark*; though other species may contribute to furnish the shops. White oak bark is recognised by its whitish epidermis and superficial furrows; internally, it has a light-brown colour and fibrous texture; taste, bitter and astringent; does not tinge the saliva. Black oak bark is darker coloured externally, more deeply furrowed, has a more bitter taste, and imparts a yellow colour to the saliva in consequence of its containing a peculiar principle, *quercitrine*: this principle renders the black oak bark valuable as a dye. Both impart their virtues to water and alcohol. They con-

tain tannic and gallic acids. Not much used internally. The white is astringent; the black frequently purges from the irritation it causes. Oak bark is employed externally in the form of bath for marasmus, or chronic diarrhœa; also as a lotion, or poultice, to indolent and gangrenous ulcers, and as a gargle in sore-throat. Dose, of powder, 30 grs.; of the decoction (*Decoctum Quercus Albæ*, U. S.), f℥ij; of the extract, 10 to 20 grs. The oak leaves and acorns are also astringent; the latter have been used in scrofula.

GALLS. (*Galla*, U. S.)—Excreescences produced by the puncture of an insect upon the young twigs of the *Quercus infectoria*, a native of Asia Minor. The market is chiefly supplied from the ports of the Levant; they are named *Aleppo galls*. There are two varieties, the *blue* and the *white*; the former are the smallest, most compact, and most valuable; the latter are of a yellowish-brown hue, lighter, and have a perforation which indicates that the insect which they contained has made its escape. The blue galls are to be preferred; they have a flinty fracture, no odour, a bitter and very astringent taste, yield their virtues to water and alcohol; they contain much tannic and gallic acids. *Incompatibles*,—the same as of tannin.

Uses.—Chiefly externally, in the form of decoction, as a gargle, or lotion; also as an ointment (*Unguent. Gallæ*, U. S.), for piles. Dose of powder, 10 to 20 grs.; of the decoction, f℥ij. The tincture (*Tinct. Gallæ*, U. S.) is chiefly used for a test.

The *syrup* is used in chronic diarrhœa.

KINO, U. S.—An extract, or an inspissated juice of certain trees. Several varieties are noticed: 1. East India or Amboyna, from *Pterocarpus marsupium*; 2. African—supposed to be the product of the *Pterocarpus erinaceus*, of Senegal; 3. Jâmaica or West India—derived from the *Coccoloba uvifera*; 4. Botany Bay,—the concrete juice of the *Eucalyptus resinifera*; 5. Caraccas.—The one most used is the Amboyna or East India. It comes in small, irregular, angular fragments, of a dark reddish-brown colour, shining fracture, no odour, but a very astringent taste. Soluble in hot water and alcohol. Active principle, that variety of tannic acid which affords a greenish-black precipitate with the persalts of iron.

Uses.—One of the most used, internally, of all the astringents; employed frequently with chalk and laudanum in diarrhœa and dysentery, not attended with inflammation; also in passive hemorrhages, leucorrhœa, and diabetes. Dose of powder, 10 to 30 grs.; of the infusion (℥ij to f℥vj water), f℥ss.; of the tincture (*Tinct. Kino*, U. S.) f℥ss. to f℥ij. Kino is used externally, as an injection, in gonorrhœa, leucorrhœa, and hemorrhages; also for indolent ulcers.

CATECHU, U. S.—Extract of the *Acacia catechu*, a thorny tree growing in Hindostan. Procured by making a decoction of the wood, and then evaporating to a proper consistence. Formerly called *Terra Japonica*, from its supposed earthy origin. There are several varieties of Catechu, one of which is derived from the *Betel nut*, and another, called *cutch*, or *Gambir*, from the *Uncaria gambir* of Sumatra.

Fig. 1.



Prop.—Irregular masses of various sizes; colour, externally, rusty brown, lighter within; taste, bitter and astringent; active ingredient, the same variety of tannin as is found in kino,—which it resembles very much in all its properties. It also contains a principle called *Catechuic acid*.

Uses.—Same as kino. Dose of powder, 10 to 30 grains.

The compound infusion (*Infusum Catechu Compositum*, U. S.) contains 3ss of catechu, 3j of cinnamon, and Oj of boiling water; it is used in bowel-affections; dose, f 3ss–j. The *tincture* is preferable to the tincture of kino, in consequence of not gelatinizing; dose f 3j–ij. *Troches* of catechu are employed for relaxed uvula.

RHATANY. (*Krameria*, U. S.)—Root of the *Krameria triandra*, a small shrub growing in Peru and Brazil. The root is branching, and, as found in the shops, is in pieces of various sizes, from the thickness of a quill upwards; colour externally, dark reddish-brown; rather lighter within; taste, bitter, astringent, and sweetish; active principle, tannic acid, which resides most in the cortical portion;—imparts its virtues to water and alcohol.

Uses.—Same as those of kino; a strong and good astringent. The external application is very useful in *fissure of the anus*,—the saturated infusion, made by displacement, or the solution of the extract being used; likewise as an injection in leucorrhœa and gonorrhœa. Dose of powder, 20 to 30 grs.; of the infusion (*Infusum Krameria*, U. S.), best made by displacement (3j to Oj water), f 3j to f 3ij; of the tincture (*Tinct. Krameria*, U. S.), f 3j to f 3ij; of the extract (*Extractum Krameria*, U. S.), made by evaporating the

cold infusion obtained by percolation, 10 to 15 grs. There is also a *syrup*; dose fʒj-iv.

LOGWOOD. (*Hæmatoxylin*, U. S.)—Wood of the *Hæmatoxylin Campechianum*, a large tree growing in Mexico, and other parts of tropical America. It is imported in the form of billets, several feet long; has a dark-purplish colour externally, and a bright-red hue internally. It is much used as a dyewood; kept in the shops in the form of raspings; odour, slight; taste, sweetish and astringent; contains a peculiar principle called *hematin* or *hæmatoxylin*; also some tannin.

Uses.—A mild astringent; useful in the bowel-affections of children. Given in decoction and extract; dose of former (*Decoctum Hæmatoxyli*, U. S.), fʒij; of the latter (*Extractum Hæmatoxyli*, U. S.), 10 to 30 grs.

The most important indigenous astringents are the *Geranium*, *Blackberry root*, *Pipsissewa*, and *Uva Ursi*.

CRANESBILL. (*Geranium*, U. S.)—Rhizoma of the *Geranium maculatum*, a small perennial plant growing in moist, shady woods; often called *crowfoot*, from the shape of the leaf. The root is horizontal, about a quarter of an inch thick, and furnished with short fibres; colour, externally, brownish; lighter within; no odour; taste, astringent. Virtues depend on tannic acid, and are extracted by water and alcohol.

Uses.—An excellent astringent; employed much in domestic practice, particularly in cases of children, to whom it may be given boiled in milk. Dose of powder, 20 to 30 grs.; of the decoction, or infusion, fʒj to fʒij.

BLACKBERRY ROOT. (*Rubus villosus*, U. S., **DEWBERRY ROOT.** (*Rubus trivialis*, U. S.)—These two roots are identical in medical properties and uses. They occur in pieces of various lengths, of a brownish colour, covered with a thin bark, which abounds most in the active principle, tannic acid.

Uses.—An excellent domestic astringent, much employed in chronic diarrhœas and dysentery; also in the latter stages of cholera infantum. Dose of powder, 20 to 30 grs.; best given in decoction, made by boiling ʒj of the smaller roots in a pint and a half of water, down to a pint; dose, fʒij. The *fruit* is slightly astringent and an agreeable demulcent.

PIPSISSEWA. (*Chimaphila*, U. S.)—Leaves of the *Chimaphila umbellata*, sometimes called *Winter-green*, a small evergreen plant, indigenous to both continents. It has a creeping root, which sends up several erect stems, from four to eight inches high. The leaves are about an inch and a half long, serrated, of a green colour. When bruised, and in the fresh state, they emit an aromatic odour. They retain their green colour, if well dried. Taste, bitter, astringent.

gent, and aromatic; water and alcohol extract its virtues, which depend on tannin and a bitter extractive.

Uses.—Chiefly as a mild alterative tonic in scrofulous complaints, and in diseases of the urinary organs; also, in dropsy, attended with dyspepsia and debility. It is best given in the form of decoction and extract. Doses of the former (*Decoctum Chimaphilæ*, U. S.), fʒiv, several times a day; of the latter, 20 to 30 grs. An excellent mode of administering pipsissewa is in the form of beer, made by adding molasses, ginger, and yeast to the decoction. A good *infusion* is obtained by displacement.

UVA URSI, U. S.—Leaves of the *Arctostaphylos Uva Ursi*, or bear berry, a small, trailing, evergreen shrub, growing in the northern parts of both continents. The leaves are obovate, about half an inch in length, thick and entire, a good deal resembling the box leaves. They are apt to be adulterated with the leaves of the red whortleberry. No odour when fresh, but acquire the smell of hay by drying; *taste*, bitter, astringent, and sweetish; virtues are yielded to alcohol and water, and depend on tannin and a bitter extractive.

Uses.—Chiefly in disorders of the urinary organs, as catarrh of the bladder, chronic nephritis, diabetes, and incontinence of urine. It is not, however, a certain remedy. Dose of powder, 20 grs. to ʒj, three times a day; of the decoction (*Decoctum Uvæ Ursi*, U. S.), —made by boiling ʒj in Ojss of water, down to Oj, fʒj to fʒij.

There are a few other vegetable astringents, which are occasionally employed: these are the rind of the Pomegranate (*Granati Fructus Cortex*), the bark and unripe fruit of the Persimmon (*Diospyrus*), and the Bistort and Tormentil roots.

The *Rosa Gallica*, or Red rose leaves, is also astringent; the confection (*Confectio Rosæ*, U. S.), and the compound infusion (*Infusum Rosæ compositum*, U. S.), are officinal. The *confection* is made by incorporating powdered red roses, sugar, honey, and rose-water together. The *compound infusion* contains some dilute sulphuric acid, which renders it slightly refrigerant. The Hundred-leaved Rose (*Rosa centifolia*, U. S.) is not astringent. The latter species furnishes the rose-water (*Aqua Rosæ*, U. S.) of the shops, and the *Unguentum Aquæ Rosæ*, U. S., or cold cream.

MINERAL ASTRINGENTS.

LEAD. (*Plumbum*, U. S.)—Not employed in medicine, in the metallic state. Its preparations are characterized by the union of astringent with sedative properties; and they may all be regarded as poisonous in over-doses, with the exception of the *sulphate*, which is extremely insoluble. The poisonous impression may be produced in two modes, either by their being absorbed into the blood, and

then acting upon the nervous centres, or by their local irritant action. Lead is very apt, when taken in improper quantities, to cause a series of symptoms called *colica pictonum*, or *painters' colic*; of which the most prominent are, loss of appetite, painful and constipated state of the bowels, acute pain about the umbilicus, with a knotty feel of the abdominal muscles, followed by general cramps, convulsions, and death. It also occasionally produces a paralysis, most generally of the upper extremities, denominated *lead palsy*. These poisonous effects are generally the result of long exposure to the fumes of melted lead, and are usually met with in workmen of lead factories, painters, solderers, &c. It is recommended that such persons should use diluted sulphuric acid, for the purpose of converting any preparation of lead, which may be in the system, into the sulphate.

Litharge. (*Plumbi Oxidum Semivitrificum*, U. S.)—Prepared in the extraction of silver from the argentiferous galena. It is in the form of small semi-vitrified scales, of a flesh colour. They usually contain some carbonic acid. Its chief use is in the preparation of *Lead Plaster* (*Emplastrum Plumbi*, U. S.), made by boiling together litharge, olive oil, and water; it consists of an *oleo-margarate of lead*. It is the foundation of most of the other plasters.

Carbonate of Lead. (*Plumbi Carbonas*, U. S.)—Called also *White Lead*. Prepared by exposing lead in thin sheets to the action of the vapours of vinegar, at the temperature of fermenting manure: the vinegar furnishes oxygen and acetic acid, by which a *subacetate* is first formed; and the decomposing manure yields the carbonic acid.

Prop.—A white, heavy, insoluble substance, without smell and taste; one of the most poisonous of the salts of lead; not used as a medicine internally; occasionally applied to excoriated and burnt surfaces; used also in the manufacture of the plaster (*Emplastrum Plumbi Carbonatis*), made to imitate Mahy's Plaster. It is applied to bed-sores. The ointment (*Unguentum Plumbi Carbonatis*, U. S.) is used for excoriated and abraded surfaces.

Acetate of Lead. (*Plumbi Acetas*, U. S.)—*Sugar of Lead.*—Prepared by dissolving litharge, or the carbonate in distilled vinegar, by the aid of heat.

Prop.—A white salt; crystallizes in needle-shaped forms; odour, peculiar; taste, sweetish and astringent; effloresces on exposure; perfectly soluble in pure water, but gives a turbid solution, if there be any carbonic acid present. This may be remedied by a few drops of distilled vinegar. *Incompatibles*, the mineral acids and their soluble salts, the alkalies, alkaline earths, and carbonates, and vegetable astringents.

Uses.—Internally, in hemorrhages, particularly hæmoptysis; also in dysentery, cholera infantum, and in certain disorders of the mucous membrane of the stomach, as in yellow fever, and malignant

remittents and intermittents. Dose, gr. ss to gr. ij, every two or three hours, according to circumstances. Used very much as a topical application, particularly in inflammations of the mucous membranes and the skin. The strength of the solution, for mucous membranes, is from gr. ss to gr. ij in f℥j of water; for the sound skin, ℥ij dissolved in Oj of water.

Solution of the Subacetate of Lead.—*Liquor Plumbi Subacetatis*, U. S.—(*Goulard's Extract*).—Prepared by boiling together equal quantities of sugar of lead and litharge. It is not uniform in its strength, varying with the quantity of lead contained in the preparation. It is a colourless, limpid fluid, having a sweetish, astringent taste. It is decomposed by whatever is incompatible with the acetate, and also by gum and starch. It must be preserved in closely-stopped bottles, to keep it from the carbonic acid of the air.

Uses.—Never internally; externally, diluted, to sprains, bruises, burns, and ulcers, in the proportion of ℥ij or ℥iij to the Oj of water.

Lead Water. (*Liquor Plumbi Subacetatis Dilutus*, U. S.)—Contains only ℥j to Oj of water. Used for sprains, &c.

Goulard's Cerate.—(*Ceratum Plumbi Subacetatis*, U. S.)—is made by boiling together Goulard's extract, white wax, olive oil, and camphor; it is an excellent application to abraded surfaces, and to blisters not disposed to heal.

The *iodide* and *nitrate* are also officinal.

ALUM. (*Alumen*, U. S.)—Chemically, a double sulphate of alumina and potassa; sometimes found native, though usually made artificially, either from some of the native ores of alum, or by a direct combination of the elements. Some varieties of alum contain sulphate of soda, or sulphate of ammonia, instead of sulphate of potassa.

Prop.—A white crystalline salt, slightly efflorescent, crystallizes in regular octohedrons: taste, sweetish and astringent; very soluble in hot water, which deposits crystals on cooling; reddens litmus; when heated, undergoes the aqueous fusion, and is converted into *dried alum* (*Alumen Exsiccatum*, U. S.) The alum of commerce generally contains some iron as an impurity.

Incompatibles.—The alkalies and their carbonates, lime-water, magnesia and its carbonate, sugar of lead, and tartrate of potassa.

Uses.—A powerful astringent, both general and local. When long used, it is apt to injure the organs of digestion. Large doses occasion irritation of the stomach and bowels, and even inflammation. Given internally, in hemorrhages, particularly of the uterus and lungs; also in colica pictonum, where it is supposed to do good by a chemical action; formerly used in intermittents. Its nauseant effect is best obviated by combining it with aromatics and opium.

Employed externally, as an astringent to the throat in inflammation; also to arrest slight hemorrhages, as in epistaxis, and bleeding from leech-bites; also as an injection in leucorrhœa and chronic diarrhœa, and as a wash to indolent ulcers.

Alum-curd is made by rubbing up alum with the white of an egg; used in conjunctivitis.

Alum-why is made by boiling 3ij of alum in a pint of milk, and straining; dose, f3ij.—Dose of powdered alum, 5 to 15 grains, several times a day; in hemorrhages, the dose must be much increased. Alum is sometimes used as an *emetic*.

The preparations of *copper*, *zinc*, and *silver* are also astringent; but as they are also *tonic*, they will be spoken of under the latter head.

CLASS II.

TONICS.

TONICS are medicines possessing the power of gradually increasing the tone of the muscular fibre, when relaxed, and the vigour of the body when weakened by disease. Muscular power and tonicity are not always associated; the former may be increased under excitement, where there is actual debility. Though resembling astringents in some of their effects, they do not produce corrugation, except when combined with the astringent principle. They resemble the stimulants in the fact of acting on the system through the medium of the nervous system; but they differ from these in the slowness, as well as the permanency of their effects. Tonics increase the *power*, while mere stimulants only produce increased *action*. Carried to excess, they are productive of debility; and if used in a state of health, they act injuriously, causing an excitation, followed by a proportionate degree of debility. Tonics are particularly indicated in functional disorders of the digestive organs, as dyspepsia, and in the convalescence from acute disorders. *Bitterness* was at one time supposed to be an essential condition to constitute any remedy a tonic; and although it is true that nearly, if not quite all, the vegetable tonics have a bitter taste, still the fact that the mineral tonics are not bitter, would serve to prove that bitterness is not absolutely indispensable in a tonic medicine.

Tonics produce their effects either through the nervous system, upon the tonicity or nutrition; or by a direct impression upon the

stomach, enabling it to perform the digestive process better, and so to prepare a more nourishing material for the blood.

They may be conveniently arranged under the two orders of Vegetable and Mineral tonics.

VEGETABLE TONICS.

These may be divided into 1, the Simple or Pure Bitters; 2, Bitters of Peculiar Properties; 3, Stimulant Tonics; 4, Aromatics.

The modification may be caused by some property inherent in the bitter principle, as in the Peruvian bark; or it may be caused by the presence of some stimulating volatile oil, as in serpentaria; or of a sedative principle, as in the case of wild-cherry bark.

I. SIMPLE BITTERS.

These merely increase the appetite and promote digestion, without increasing the circulation. They are especially useful in dyspepsia and in convalescence.

QUASSIA, U. S.—Wood of the *Quassia amara*, and *Simaruba excelsa*, trees growing in South America and Jamaica. Imported in billets, which are nearly white, very light in texture, no odour, and a pure, intensely bitter taste. Kept in the shops in the form of chips or raspings. Contains a peculiar bitter principle called *quassin*. Cold water and alcohol extract its virtues.

Uses.—A pure bitter tonic; does not excite the system; applicable in simple dyspepsia, and in convalescence from acute disorders. Used in South America in the treatment of remittent fever.

Dose of powder, 20 grains to ʒj; of the infusion (*Infusum Quassiae*, U. S.), made with ʒij to Oj of cold water, f ʒij; of the extract (*Extractum Quassiae*, U. S.), gr. ij to gr. v; of the tincture (*Tinctura Quassiae*, U. S.), f ʒj to f ʒij.

Simaruba,—the bark of the *Simaruba officinalis* possesses properties similar to those of quassia, and may be substituted for it.

COLUMBO.—(*Colomba*, U. S.)—Root of the *Cocculus palmatus* (Fig. 2), a climbing plant, growing in Mozambique. The root is perennial, consisting of a main body and numerous offsets. The root, when dug up by the natives, is sliced transversely, and dried. Found in the shops in circular or oval disks, from half an inch to two inches in diameter, and from a quarter to three quarters of an inch in thickness. The epidermis is wrinkled, and of a brownish colour; beneath this is a yellow cortical portion, and within this, the shrunken, whitish, medullary part. It is liable to be attacked by worms, from the starch which it contains. Odour, slightly aromatic; taste, bitter and mucilaginous. Should not be kept in the state of powder, from its liability to attract moisture. Water and alcohol attract its active properties, which depend on a peculiar principle called *columbin*.

Prop.—A mild and excellent tonic; a good remedy in simple dyspepsia, and in convalescence; also in the declining stages of

Fig. 2.



dysentery and diarrhoea. Often given with purgatives and aromatics.

Dose of powder, 10 to 20 grains; of the infusion, (*Infusum Colombee*, U. S.,) made with ℥ss. to Oj of cold water, f℥j to f℥ij; of the tincture, (*Tinc. Colombee*, U. S.,) f℥j to f℥ij.

Fig. 3.



GENTIAN. (*Gentiana*, U. S.)—Root of the *Gentiana lutea*, a perennial plant, growing in the mountainous regions of Europe.

It comes in pieces of considerable length, sometimes sliced longitudinally, twisted and much wrinkled externally, and of a reddish-brown colour; yellowish within; of a spongy texture; odour, feeble, and somewhat peculiar; taste, very bitter and sweetish; colour of powder, yellowish. Water and alcohol extract its virtues, which depend chiefly on a peculiar crystalline bitter principle called *gentianin*.

Prop.—A pure simple bitter, much employed in dyspepsia, particularly in the form of infusion, made with senna, or rhubarb, and ginger. Its powder is often combined with iron and purgatives. Gentian is slightly stimulant.

Dose of powder, 10 to 40 grains; of the infusion; made with ℥j to Oj of cold or hot water, f ℥ij. The compound infusion (*Infusum Gentianæ Compositum*, U. S.), contains orange-peel, coriander seeds, and a little dilute alcohol. The tincture (*Tinctura Gentianæ Composita*, U. S.), contains cardamom seed and orange-peel, and is one of the best of the bitter tinctures; dose f ℥j to f ℥ij. The extract (*Extractum Gentianæ*, U. S.) is used in the dose of 5 to 30 grains.

White Gentian—the root of *Gentiana purpurea*—is occasionally seen in the markets.

The *American Columbo* (*Frasera*, U. S.)—root of the *Frasera Walteri*—is an indigenous Gentian, growing west of the Alleghany Mountains. Its properties, &c., resemble those of Gentian.

GOLD THREAD. (*Coptis*, U. S.)—Root of the *Coptis trifolia*, a small, evergreen, herbaceous plant, growing in New England. The plant much resembles a strawberry vine, and has a thin interlaced root, of a golden-yellow colour. In its general properties it strongly resembles quassia; its virtue depends on a bitter extractive. Best given in infusion, made with ℥ss to Oj of water; used sometimes as a wash in aphthous sore mouths.

The *Sabbatia angularis*, or *American centaury* (*Sabbatia*, U. S.), is another excellent indigenous tonic, having properties resembling those of the above-named simple bitters. It is generally used in the form of infusion.

THOROUGHWORT—BONESET. (*Eupatorium*, U. S.)—The herb *Eupatorium perfoliatum*,—an indigenous perennial, growing in moist places, distinguished by the perfoliate character of its leaves, each pair of which are at right angles to those immediately above and below. It has a faint odour, and a strong, bitter taste. Hot water extracts its virtues, which are believed to reside in a bitter principle. The cold infusion acts as a mild, pleasant tonic; the hot infusion as a diaphoretic, or even as an emetic.

II. BITTERS OF MODIFIED PROPERTIES.

PERUVIAN BARK. (*Cinchona*, U. S.)—The genus *Cinchona* of the former botanists, comprised as many as fifty distinct species;

Professor Lindley mentions twenty-six species, most of which are well known. Of these the most important, as affording most of the bark of commerce, are the *C. Condaminea*, *C. micrantha*, *C. cordifolia*, and *C. Calisaya*. The genuine cinchona trees are exclusively found within the geographical limits of La Paz, about 20° of south latitude, and Santa Martha, about 11° of north latitude. They inhabit the mountainous regions of the Andes, usually about 6000 feet above the level of the sea. The several localities which furnish the bark are the following, in their order of discovery:—Loxa, Sta. Fe de Bogota, Huanuco, La Paz, and Sta. Martha. Of these, Bogota and Sta. Martha furnish the *Carthagena barks*; the others furnish the *officinal barks*. The name *Cinchona* was given to the genus from the circumstance that the Countess of Cinchona was cured of intermittent fever by the use of the bark. It was also named *Jesuits' bark* and *Jesuits' powder*, from its having been used by the Jesuits as a secret remedy. All the different species of the *Cinchona* have their own peculiar botanical characteristics: they

Fig. 4.



resemble each other, however, in their general features: thus they all have opposite leaves, set upon short petioles; the flowers are at

the extremities of the branches, and of a white or rose colour. Fig. 4 represents a branch of the *C. Condaminea*.

There are only three varieties of genuine Peruvian bark recognised by the pharmacopœias; these are the *pale*, the *yellow*, and the *red*.

Pale Bark (*Cinchona pallida*, U. S.)—Called also *Loxa* or *Crown bark*, and by the French, *gray bark*. It includes the commercial varieties of *Loxa*, and *Lima* or *Huanuco* barks; and is the product of the *C. Condaminea*, and the *C. micrantha*. It comes only in quills, which are from half a foot to a foot long, from two lines to an inch in diameter; the epidermis is marked by numerous transverse cracks; colour of epidermis, gray, though often diversified; internal colour, cinnamon; fracture, smooth; colour of powder, lighter than the others; taste, bitter and astringent, but less bitter than the others.

Yellow Bark (*Cinchona flava*, U. S.)—Called also *royal yellow* and *Calisaya* bark. The species which yields it has been ascertained by Widdel to be the *C. Calisaya*. It comes in quills and flat pieces; the former are from three inches to a foot in length, and from a quarter of an inch to two inches in diameter; epidermis, brownish, marked by longitudinal wrinkles and transverse fissures; epidermis often wanting; texture fibrous; fracture splintery, exhibiting minute spiculæ; colour of bark, yellow-orange; taste, bitter and nauseous; odour, tan-like; relative value superior to the others, as it abounds most in quinia.

Red Bark (*Cinchona rubra*, U. S.)—Supposed to be derived from the larger branches and trunk of the same tree which yields the pale bark; size of quills, half an inch to two inches in diameter, and two to twelve inches long; flat pieces are large and thick; external colour reddish-brown, with a very rough epidermis, which occasionally exhibits warts upon it; colour of powder, reddish; taste, very bitter.

The *pale bark* contains most cinchonia, the *yellow* most quinia, and the *red* about an equal portion of both alkalies.

The varieties of bark called *Carthagena* barks are much inferior to those just described. They are all shipped from the northern or Atlantic ports of South America.

Cinchona yields its virtues to water and alcohol. Its active principles are two alkalies named *quinia* and *cinchonia*, which exist combined with *kinic acid*. It also contains *cinchonic red*, *cinchonic yellow*, *tannic acid*, *gum*, &c.

Quinia is prepared by macerating *Calisaya* bark in water, acidulated with muriatic acid; this acid forms the soluble muriate of quinia; filter, and add lime, which throws down the quinia, chloride of calcium remaining in solution; next add boiling alcohol, which takes up the quinia, which may then be decolorized by animal char-

coal, and separated by evaporation. It occurs in a white flocculent powder; nearly insoluble in water; very soluble in boiling alcohol, ether, and volatile oils; unites with acids to form salts, of which the most important is the officinal *sulphate*.

Cinchonia is a white crystalline substance, with general properties resembling those of quinia.

Incompatibles.—The alkalies, alkaline earths, acetate of lead, and tannic acid.

Physiological effects.—A tonic in small doses, and also anti-periodic; the latter is peculiar, and is not dependent upon its tonic properties. In full doses, apt to occasion oppression of stomach, nausea, and purging; it also acts upon the cerebro-spinal system; as evinced by the tension of the head, ringing of the ears, and occasional deafness.

Uses.—As a mere tonic, it is inferior to the simple bitters in dyspepsia, but applicable in exhausting stages of disease, particularly in suppurations, also in typhoid complaints, in neuralgia, and in rheumatism. Its most important use is in intermittent diseases, especially intermittent and remittent fever; believed to do good in these affections through the agency of the nervous system.

Cinchona is given in powder, infusion, decoction, tincture, and extract. Most powerful in substance, but apt to disagree with the stomach, and offensive on account of its bulk; dose $\mathfrak{z}\text{j}$, repeated so as to give $\mathfrak{z}\text{j}$ to $\mathfrak{z}\text{ij}$ in the intermission; its efficacy is increased by combining it with serpentaria. Powdered bark sometimes used externally, in the form of quilted jackets—applied to children. Dose of the *infusion* (*Infusum Cinchonæ Flavæ*, U. S.), ($\mathfrak{z}\text{j}$ to Oj boiling water) $\text{f}\mathfrak{z}\text{ij}$. Dose of the *decoction* (*Decoctum Cinchonæ Flavæ*, U. S.), the same. The cold infusion (*Infus. Cinch. Compos.*, U. S.), is preferable, made with cold water, acidulated with sulphuric acid, which more completely exhausts the virtues of the bark, and gives a clear infusion. Dose of *tincture* (*Tinctura Cinchonæ*, U. S.), $\text{f}\mathfrak{z}\text{j}$ to $\text{f}\mathfrak{z}\text{iv}$. *Huxam's tincture* (*Tinct. Cinch. Composita*, U. S.), contains also serpentaria and other ingredients; dose, the same. Dose of extract, 10 to 30 grs.

Sulphate of Quinia.—Chemically a *disulphate*; made by adding dilute sulphuric acid to quinia, and crystallizing. Occurs in light, feathery, white crystals, without odour; taste bitter; soluble in boiling water and alcohol, and the dilute acids; cold water freely dissolves it by the aid of sulphuric acid; colour of the solution, opalescent. It is apt to be adulterated, which may be detected if with a mineral substance, as sulphate of lime, by a residue being left on exposing it to a high heat; gum, by its greater solubility; starch, by iodine, &c.

Effects on System.—Generally similar to those of the bark, but sometimes fails to cure intermittents, when the bark will succeed.

Dose, 10 to 14 grs., equivalent to $\bar{3}j$ of good bark; ordinary dose, one to three grains; may be often given by enema; also endermically.

Dose of the *impure sulphate of quinia*, or *quinoidine* (made by evaporating the mother waters), double that of the sulphate. Dose of *sulphate of cinchonia*, the same as that of sulphate of quinia.

The best substitutes for Peruvian bark are the *salix*, or willow, which contains a bitter principle, called *salicin*; the barks of the *Swietera febrifuga*, the *Horsechestnut*, and the *Dogwood*; the latter contains a peculiar bitter principle, named *cornine*. Also, the *Liriodendron Tulipifera*, U. S., or *American Tulip-Tree*.

WILD CHERRY BARK. (*Prunus Virginiana*, U. S.)—Bark of the *Cerasus Serotina*, an indigenous tree. The bark is taken both from the stem and root; comes in pieces several inches long, slightly curved, usually deprived of the epidermis; has a cinnamon colour; taste, bitter and aromatic, with the flavour of the bitter almond; odour, similar; active properties to water and alcohol; injured by heat. Active principles, hydrocyanic acid and a volatile oil; these do not pre-exist in the plant, but are the result of a reaction between the *amygdaline* and *emulsine* with water.

Effects.—A tonic to the digestive organs, and at the same time sedative to the system. Useful in convalescence, attended with irritability of the stomach; also in the hectic of phthisis.

Best given in *cold infusion* (*Infusum Pruni Virginianæ*, U. S.), made by macerating half an ounce in a pint of cold water 24 hours, or by displacement; dose, $\bar{f} \bar{3}ij$ three times a day. There is also a *syrup* (*Syrupus Prun. Virginianæ*, U. S.), which is an excellent preparation; dose, $\bar{f} \bar{3}j$ —iv.

STIMULANT TONICS.

These tonics are more stimulating to the system than the foregoing. They owe their stimulating properties to a volatile oil.

VIRGINIA SNAKE ROOT. (*Serpentaria*, U. S.)—Root of the *Aristolochia serpentaria*, an indigenous herbaceous plant, growing in rich woods. The root is perennial, consisting of numerous long slender fibres, proceeding from a common caudex. As found in the shops, it is in tufts of a brownish colour; has a strong camphorous odour, and a very bitter, acrid, camphorous taste. It yields its virtues to alcohol and water; active ingredients, a volatile oil and a bitter principle.

Effects.—A stimulant tonic; used in low forms of disease; also, stimulates the secretions; employed sometimes as an adjuvant to Peruvian bark.

Dose of powder, 10 to 30 grs.; of the infusion (*Infusum Serpentariæ*, U. S.), (made with $\bar{3}ss$ to Oj water) $\bar{f} \bar{3}j$ to $\bar{f} \bar{3}ij$; of the

tincture (*Tinctura Serpentaria*, U. S.), f ʒj to f ʒij. The decoction and extract are objectionable.

CHAMOMILE. (*Anthemis*, U. S.)—Flowers of the *Anthemis nobilis*, a small, herbaceous perennial, indigenous to Europe, but introduced into the United States. The flowers are both double and single; the latter said to be the strongest. Imported usually from England. They are about half an inch in diameter, nearly spherical, of a yellowish-white colour; odour, fragrant and aromatic; taste, warm, aromatic, and bitter; virtues depend on a volative oil and bitter extractive, which are imparted to water and alcohol.

Prop.—A mild, stimulant tonic; useful in convalescence and some forms of dyspepsia; the warm infusion acts as a diaphoretic and emetic. Dose of *cold infusion* (ʒss to Oj), as a tonic, f ʒij.

There are several other herbaceous plants, which are mildly stimulant and tonic to the system, as Wormwood (*Absinthium*), Tansey (*Tanacetum*), Horehound (*Marrubium*). These all contain a volatile oil and a bitter principle.

CASCARILLA BARK. (*Cascarilla*, U. S.)—Bark of the *Croton Eleutheria*, and of the *Croton cascarilla*, trees growing in the West Indies; chiefly imported from Eleutheria, one of the Bahamas; comes in small-sized quills, and in small chips; epidermis is partially detached. Odour aromatic; when thrown upon hot coals it exhales an agreeable odour like musk; taste, bitter and aromatic. Used chiefly as an adjuvant to other tonics. Active ingredients, a volatile oil, and bitter extractive. Dose of powder, 20 to 30 grs.; of the infusion (*Infusum Cascarillæ*, U. S.), made in proportion of ʒj to Oj, f ʒij.

ANGUSTURA BARK. (*Angustura*, U. S.)—Bark of the *Galipea officinalis*, and probably of *G. Cusparia*, a small tree growing in South America. It comes in pieces slightly curved, about a line in thickness, and bevelled at the edges. Colour, yellowish-gray; taste, bitter and aromatic. Virtues depend upon a volatile oil and bitter extractive. A stimulant tonic, not much employed at present; should be carefully distinguished from the *false Angustura bark*, which is derived from the *Nux Vomica*, and is very poisonous. The *true bark* is always bevelled at the edges, and softens and becomes pliant like leather on being soaked in water. The false variety is intensely bitter to the taste, and gives a red colour when touched with nitric acid, from the *brucia* which it contains. Dose of the *powder*, 10 to 20 grs.; of the *infusion* (*Infusum Angusturæ*, U. S.), f ʒj–ij.

MYRRH. (*Myrrha*, U. S.)—An exudation from the *Balsamodendron myrrha*, a shrub, or small tree, growing in Arabia and Abyssinia. The juice exudes spontaneously, or by incision. Two commercial varieties—*India* and *Turkey myrrh*: the latter is the

finest ; comes in masses and tears ; of a pale reddish-yellow colour, semi-transparent and brittle ; of an aromatic peculiar odour. India myrrh is much inferior,—darker, softer, and much mixed with a substance called *bdellium*. Myrrh is usually imported from Bombay. It is a gum-resin, associated with a volatile oil ; forms a clear tincture with alcohol, and with water a yellow opaque emulsion.

Fig. 5.



The alkalies have the property of uniting with myrrh, and rendering it more soluble in water. Its active properties reside chiefly in the resin.

Effects.—A stimulant tonic, with a tendency at the same time to the lungs and uterus. Most employed in chronic pectoral affections, and in amenorrhœa. Dose of powder, 10 to 30 grains ; of the tincture, fʒss to fʒj. The *tinctura* (*Tinctura Myrrhæ*, U. S.) is most used as an external application to spongy gums, and to indolent ulcers.

AROMATIC TONICS.

Aromatics are substances possessing an agreeable penetrating odour, and a warm, pleasant taste. These properties depend upon a *volatile oil*, which may be generally separated by distillation with water.

The *volatile oils* (*essential* or *distilled oils*) have the odour and taste of the substances from which they are procured ; sp. gr. generally less than that of water ; almost insoluble in water ; soluble in alcohol, ether, and the fixed oils. Their *proximate* composition is into two principles, *stearoptine* and *eleoptine* ; the former is solid, the latter liquid. If adulterated with a fixed oil, the fraud may be detected by their leaving a permanent greasy stain upon paper.

All the aromatics possess stimulant properties, though in different degrees. They include the *spices*, which, on account of their agreeable odour and taste, are much employed as condiments, and also for flavouring or disguising less pleasant medicines. As medicines, they act as grateful stimuli; creating warmth of stomach, obviating nausea, expelling flatulence, and relieving slight colic.

ORANGE PEEL. (*Aurantii Cortex*, U. S.)—The outer rind of the orange (*Citrus aurantium*, or *C. vulgaris*). There are two varieties of orange—the *sweet*, and the *bitter* or *Seville orange*; the rind of the latter only is tonic. As usually prepared by simply peeling the fruit and drying, it is apt to become mouldy; the inner portion should be first rejected. The bitter variety contains a bitter extractive and volatile oil. It is a mild aromatic, chiefly used for flavouring.

The *confection* (*Confectio Aurantii Corticis*, U. S.) is chiefly employed as a vehicle.

CINNAMON. (*Cinnamomum*, U. S.)—Bark of the *Cinnamomum*

Fig. 6.



zeylanicum (Fig. 6), a native of Ceylon. The bark is stripped from trees of six or seven years old. When dried, it curls up laterally, so as to form quills, which are inserted one within another. The variety called *Cassia* is believed to be the product of the *C. aromaticum*, a native of China, and is sent from Canton.

True cinnamon is known by its colour, the thinness of its bark, the congeries of quills in which it always comes, its splintery fracture, and its sweetish aromatic taste, more pleasant than that of cassia bark, though the best specimens of the latter may be considered nearly as good. There is a volatile oil of cinnamon, and also one of cassia. Cinnamon contains some tannic acid, which is the cause of its astringency.—It is chiefly used as an adjuvant.

Cinnamon Water (*Aqua Cinnamomi*, U. S.), is made by rubbing up the oil of cinnamon with carbonate of magnesia, and then adding water: it is used as a vehicle for other medicines. The *compound tincture* (*Tinctura Cinnamomi Composita*, U. S.), containing also cardamom, caraway, raisins, and cochineal, is used in the dose of f ʒj to f ʒij.

Pulvis Aromaticus, U. S. (*Aromatic Powder*.)—Contains cinnamon, cardamom, ginger, and nutmeg. It is stimulant and carminative; used chiefly as an adjuvant.

CANELLA, U. S.—Bark of the *Canella alba*, a tree growing in the West Indies; comes in imperfect quills, of a yellowish-white colour, and a bitter aromatic taste. Its properties are those of a stimulant tonic and aromatic. Not much employed alone; an ingredient in the *hiera picra*, or *Pulvis Aloes et Canella*.

The other spices most employed are *Nutmeg*, *Cloves*, *Mace*, *Black Pepper*, *Cubebs*, and *Allspice*.

NUTMEG. (*Myristica*, U. S.)—Fruit of the *Myristica moschata*, a native of the Malaccas, but grown in Cayenne. They are the kernels of the nut, which is surrounded by a membrane, called *mace*. Nutmegs contain a volatile oil (*Oleum Myristicæ*, U. S.), procured by distillation, and a fixed oil, called *oil of mace*, obtained by expression. Nutmegs are aromatic, and, in large doses, narcotic. Used chiefly as a condiment, and to flavour farinaceous drinks. Mace is employed for the same purpose.

CLOVES. (*Caryophyllus*, U. S.)—Unexpanded flowers of the *Eugenia caryophyllata*, an evergreen, native of the Malaccas. They ought to have a deep brown colour, and an oily aspect.

Cloves are one of the most stimulant aromatics; they depend for their virtue upon a volatile oil (*Oleum Caryophylli*, U. S.), which is rather heavier than water. Dose of powder, 5 to 10 grains; of *infusion* (*Infusum Caryophilli*, U. S.), made with ʒij to the pint, f ʒij; of the volatile oil, 2 or 3 drops.

BLACK PEPPER. (*Piper*, U. S.)—Dried berries of the *Piper*

nigrum, a vine, native of the East Indies. The fruit when first ripe is red, but becomes black by drying. When deprived of its outer coating it constitutes *white pepper*. It contains a peculiar crystalline principle—*piperin*—which, however, is not the active principle; this resides in the volatile oil. Piperin has been used with advantage as an *anti-intermittent*; dose, gr. ij–viii. The fluid extract (*Extractum Piperis Fluidum*, U. S.), has been lately introduced; dose, f ʒss–j.

Black pepper is chiefly employed as a condiment; it is a decided stimulant in large doses. Its excessive use is injurious to the stomach.

CUBEBS. (*Cubeba*, U. S.)—Dried fruit of the *Piper cubeba*, a vine much resembling the last. The cubeb. berries are distinguished by being reticulated, and having a short footstalk attached to them. They have an aromatic odour, and a warm camphorous taste; depend for their virtues on a volatile oil, procured by distillation. They have a tendency to act on the kidneys, and in larger quantities to affect the head. As a medicine, its chief use is in affections of the urino-genital organs, particularly gonorrhœa. Dose of powder, ʒss to ʒj; of the volatile oil (*Oleum cubebæ*, U. S.), 10 to 20 drops. The *fluid extract* (*Extractum Cubebæ Fluidum*, U. S.) is an excellent preparation; dose, gtt. xx to f ʒj. The *tincture* (*Tinctura Cubebæ*, U. S.) is given in the dose of f ʒss–j.

ALLSPICE. (*Pimenta*, U. S.)—Called also *Jamaica pepper*. Grows in Jamaica; fruit of the *Myrtus pimenta*; called *allspice*, from its combining the flavour of several other spices. Its virtues depend on a volatile oil. Used only as a condiment.

The AROMATIC SEEDS most employed in medicine are the following:—

CARDAMOMS (*Cardamomum*, U. S.), from the *Elettaria Cardamomum*, a native of Malabar and the East Indies.

FENNEL SEED (*Fœniculum*, U. S.), from the *Fœniculum vulgare*, a native of the south of Europe, but introduced here.

CORIANDER (*Coriandrum*, U. S.), from *Coriandrum sativum*, a native of Europe, but cultivated here.

CARAWAY (*Carum*, U. S.), from *Carum Carui*, growing in Europe.

ANISE (*Anisum*, U. S.), from *Pimpinella Anisum*, a native of Europe and Africa.

These all contain a volatile oil. They are used, as well as their oils, chiefly as adjuvants, to impart an agreeable flavour to other medicines. The *tincture of Cardamoms* (*Tinctura Cardamomi*, U. S.), is an excellent stomachic aromatic for nausea and slight colic; dose, f ʒj–ij.

Fennel Water (*Aqua Fœniculi*) is much used as an agreeable vehicle for mixtures.

The following AROMATIC HERBS (*Labiata*) are also employed in medicine :

LAVENDER. (*Lavandula*, U. S.)—The flowering tops of *Lavandula vera*, native of Europe, but grown here. The flowers have a delightful odour, and yield a volatile oil on distillation. The *spirit*, or *lavender-water*, as it is often improperly named (*Spiritus Lavandule*, U. S.), is made by distilling the flowers with alcohol; it is a very agreeable perfume. The *compound spirit*, or *lavender compound* (*Spiritus Lavandulæ Compositus*, U. S.), contains spirit of lavender, spirit of rosemary, cinnamon, cloves, nutmeg, and red saunders. It is much employed as a grateful stomachic in sick stomach and mild colics; also to impart flavour; dose f 3j–ij.

ROSEMARY. (*Rosmarinus*, U. S.)—The flowering tops of *Rosmarinus officinalis*; indigenous in Europe, but grown here. It contains a highly stimulating volatile oil, used in making opodeldoc, and camphorated tincture of soap. The *spirit* (*Spiritus Rosmarini*, U. S.) is used occasionally.

PEPPERMINT. (*Mentha Piperita*, U. S.)—A native of Europe, but naturalized here. The whole herb is used, and is most active when in flower. Its *oil* is occasionally prescribed in doses of gtt. ij–iij, but is more frequently used in the form of *Essence of Peppermint* (*Tinctura Olei Menthæ Piperitæ*, U. S.), made by dissolving f 3ij of the oil in Oj of alcohol. Dose, gtt. v–xx, on a piece of loaf-sugar, to relieve nausea and slight colic. *Peppermint-water* (*Aquæ Menthæ Piperitæ*, U. S.), is prepared by rubbing up f 3ss of the oil with 3j of carbonate of magnesia, and then adding Oij of distilled water, and filtering. It is much used as a vehicle. The fresh herb bruised and applied to the stomach will frequently relieve pain and nausea; it is used chiefly for children.

SPEARMINT. (*Mentha Viridis*, U. S.)—Is very similar in properties to Peppermint. The *oil*, *essence*, and *water* are made in the same manner as the corresponding preparations of Peppermint, and are used for similar purposes.

PENNYROYAL (*Hedcoma*) is similar to the Mints in properties, though rather more stimulating.

BALM (*Melissa*, U. S.), and **MARJORAM** (*Origanum*, U. S.), are also strongly allied in properties to the preceding herbs.

SAGE. (*Salvia*, U. S.)—Leaves of *Salvia officinalis*. Contains a volatile oil and some tannic acid, which imparts to it astringent properties. It is chiefly employed in infusion (*sage-tea*) for sore throats. Alum may often advantageously be added.

PARTRIDGE-BERRY. (*Gaultheria*, U. S.)—Leaves of *Gaultheria*

procumbens. It contains a very heavy essential oil, of a dark colour, used to impart flavour; an ingredient in the compound syrup of sarsaparilla.

.GINGER. (*Zingiber*, U. S.)—Rhizoma of *Zingiber officinale*, a perennial, herbaceous plant, growing in the East and West Indies. Several varieties are found in the shops. Sometimes the recent root, in a state of vegetation, is sent to the market, constituting *green ginger*; sometimes the root is dug up, scalded to prevent germination, and then dried, constituting common *black ginger*; again, the best pieces are selected, the outer skin removed, so as to give it a white appearance, and imported as *white ginger*. The latter comes from Jamaica.

Colour of the powder, light yellowish-white; odour, powerful and peculiar; taste, strong, aromatic, and biting. It contains a volatile oil, an acrid resin and starch.

It is a grateful stimulant and carminative; used to expel flatus from the bowels; employed also as an adjuvant to the bitter tonics, in cases of dyspepsia. It is apt to be much deteriorated by age.

Given in powder, infusion, tincture, and syrup. Dose of powder, 10 to 30 grs.; of the infusion (*Infusum Zingiberis*, U. S.), made with f 3ss to the pint, f 3ij; of the tincture (*Tinctura Zingiberis*, U. S.), f 3j. The *syrup* (*Syrupus Zingiberis*, U. S.) is used generally for flavouring. Externally applied, ginger acts as a rubefacient.

SWEET FLAG. (*Calamus*, U. S.)—Rhizoma of *Acorus calamus*, a plant growing in marshes. Its effects on the system, and uses are very similar to those of ginger. It contains a volatile oil and extractive.

MINERAL TONICS.

IRON. (*Ferrum*, U. S.)—The most important of all the mineral tonics; a constituent of many organized beings, and found in the red globules of the blood. The preparations of iron, called *chalybeates*, combine tonic with astringent properties; they increase the appetite, promote digestion, and exalt the general functions of life. Under its use, the red corpuscles of the blood become much increased, giving rise to a tendency to plethora. Its influence over the nervous system appears to be rather secondary. The *chalybeates* prove most useful in dyspepsia with constipation, not accompanied by inflammation of the stomach; also in chronic debility of females associated with amenorrhœa; in some nervous affections; and especially in anemia.

Metallic iron is probably inert upon the system; but when swallowed in that state, it is apt to become converted into an oxide or salt in the stomach and bowels, and to disengage hydrogen gas, which causes unpleasant eructations. Iron filings (*Ramenta Ferri*,

U. S.), which are sometimes used, should be previously purified by means of a magnet. Dose, gr. v-xx.

Squamæ Ferri (Scales of Iron).—Obtained by hammering red-hot iron; consist chemically of the protoxide and peroxide. Dose, 5 to 20 grains.

Ferri Pulvis, U. S. (Iron by Hydrogen).—Made by passing hydrogen over the oxide heated to redness it is an efficient preparation. Dose, gr. j-v.

Rubigo Ferri (Rust of Iron).—Formerly called prepared carbonate of iron; prepared by exposing fine iron wire to air and moisture, then reducing to a fine powder by levigation and elutriation. It consists of the protocarbonate and the sesquioxide. Colour, red; taste, styptic; insoluble in water. Dose, gr. v-xx.

Ferri Subcarbonas, U. S. (Subcarbonate of Iron).—Formerly named *Precipitated Carbonate*; made by mixing together the solution of the carbonate of soda, and sulphate of iron. When first prepared the colour is greenish-black, which soon changes into a brownish-red, from the absorption of oxygen; it then consists chiefly of the sesquioxide. It has a styptic taste; no odour; is insoluble in pure water. It is one of the best chalybeates; is well borne by the stomach, and no danger from an over-dose; much used in neuralgia. Dose, 5 to 30 grains.

Pilulæ Ferri Carbonatis, U. S. (Vallæ's Ferruginous Pills).—Prepared as the subcarbonate, with the addition of honey, which prevents the absorption of oxygen; colour, bluish. Dose, 2 to 10 grains, three times a day.

Mistura Ferri Composita, U. S. (made to imitate Griffith's Antihectic Mixture).—Prepared by mixing together solutions of carbonate of potash and sulphate of iron, with myrrh and spirits of lavender. Used chiefly in amenorrhœa with dyspepsia.

Ferri Sulphas, U. S. (Sulphate of Iron—Green Vitriol, or Copperas).—Prepared by action of dilute sulphuric acid on pure iron wire. Colour, pale green; crystals efflorescent, soluble; taste, styptic; fuses when heated. *Incompatibles*—alkalies, alkaline earths, and earths with their carbonates, and those soluble salts whose acids form soluble salts with iron, and whose bases form insoluble sulphates; also tannin. It is one of the most astringent of the chalybeates, also the most irritant. Applicable when small doses are required; best in pill of the effloresced salt. Dose of the crystallized, 1 to 5 grains; of the dried, gr. ss. to grs. ij.

Tinctura Ferri Chloridi, U. S. (Muriated Tincture of Iron).—Made by the action of muriatic acid on the subcarbonate, and then adding alcohol. Colour, reddish-brown; odour, ethereal; taste, sour and styptic. Used in affections of the urino-genital organs. An excellent chalybeate. Dose, gtt. v-xx. Used externally as a stimulant.

Ferri et Potassæ Tartras, U. S. (*Tartrate of Iron and Potassa*).—Prepared by adding cream of tartar in water to the freshly-prepared hydrated oxide of iron at the temperature of 140° ; filter, evaporate to the consistence of syrup, and then spread upon glass or porcelain, so as to dry in the form of scales. *Prop.*—In transparent scales of a ruby-red colour, wholly soluble in water; the basis of the old wines of iron. It is an admirable chalybeate: dose, gr. x–xx.

Ferri Phosphas, U. S. (*Phosphate of Iron*).—Prepared by the action of phosphate of soda on sulphate of iron. It is insoluble in water; of a bluish colour, and changes by exposure. Dose, gr. x–xx.

Ferri Ferrocyanuretum, U. S. (*Ferrocyanuret of Iron, Prussian Blue*).—Prepared by the action of the persulphate of iron on ferrocyanuret of potassium. It is of a deep blue colour, and insoluble. It is tonic and sedative. Used in nervous affections, and in intermittents. Dose, gr. v–xx.

Ferri Oxidulum Hydratum, U. S. (*Hydrated (sesqui) Oxide of Iron*).—Prepared by the action of solution of ammonia on the solution of the per (sesqui) sulphate of iron (made by adding sulphuric and nitric acids to a solution of the sulphate,) and washing the precipitate with water. It should be kept in close bottles under water. *Use.*—Chiefly as the antidote for arsenic, in which case it must be given in large doses. Its remedial effects are similar to those of the carbonates.

Ferrum Ammoniatum, U. S. (*Ammoniated Iron*).—Prepared by adding muriatic acid to subcarbonate of iron, and then add muriate of ammonia, and evaporate to dryness. It is of an orange colour, soluble in water. Used chiefly in nervous disorders. Dose, gr. iv–x.

Ferri Iodidum, U. S. (*Iodide of Iron*).—Prepared by putting iodine and iron filings together in water, in a glass or porcelain vessel, and gently heating; then filter and evaporate. As it is extremely deliquescent, it is better to employ the solution (*Liquor Ferri Iodidi*, U. S.), made by the addition of sugar and water; the sugar preventing its decomposition. *Prop.*—An excellent preparation in scrofula and the cachexiæ. Dose, gr. i–ij; of the solution, gtt. x–xx.

Ferri Citras, U. S. (*Citrate of Iron*).—Made by adding citric acid in solution to the solution of the hydrated oxide, and then treat as directed for tartrate of iron and potassa. It occurs in garnet-red flakes, soluble in water. It is a mild, though certain chalybeate. Dose, gr. iij–v.

Liquor Ferri Nitratis, U. S. (*Solution of Nitrate (sesquinitrate) of Iron*).—Prepared by the action of dilute nitric acid on iron

wire. It is the most astringent of the chalybeates, and is used in chronic diarrhoeas. Dose, gtt. x-xx.

The *Lactate* is also occasionally used.

COPPER. (*Cuprum*, U. S.)—Though probably inert in the metallic state, yet being easily acted upon by the acids of the stomach, it may prove poisonous when swallowed in that state. Poisoning may also result from eating articles cooked in copper vessels. The preparations of copper act as tonics in very small doses, with an especial tendency to the nervous system. Larger doses occasion irritation and inflammation of the stomach. As *poisons*, they act both as local irritants and also upon the nervous centres. The best antidote for metallic copper is an antacid, as magnesia; for the *salts*, the best antidote is albumen.

Cupri Sulphas, U. S. (*Sulphate of Copper—Blue Vitriol.*)—Prepared by the action of sulphuric acid on metallic copper. Occurs in large, prismatic, blue crystals; efflorescent on exposure; soluble in water; taste, very styptic; fuses when heated; incompatibles, the same as of iron.

Effects on System.—Small doses are astringent and tonic; larger doses vomit; still larger are poisonous. The best antidote is albumen.

Used as a tonic in obstinate ague, and in chronic dysentery and diarrhoea; also, in epilepsy, chorea, and hysteria. Dose, $\frac{1}{4}$ grain, two or three times a day. Useful as an external application, in solution, to spongy granulations of ulcers, and inflamed conditions of mucous membranes, particularly of the eye.

Cuprum Ammoniatum, U. S. (*Ammoniated Copper.*)—Made by rubbing up carbonate of ammonia with sulphate of copper; colour, dark blue. Supposed to have a special tendency to the nervous system; hence used in epilepsy, chorea, &c. Dose, gr. ss-ij, twice a day.

ZINC. (*Zincum*, U. S.)—Its preparations are useful in nervous disorders.

Zinci Sulphas, U. S. (*Sulphate of Zinc—White Vitriol.*)—Made by action of dilute sulphuric acid on metallic zinc. Crystals, needle-shaped prisms, white; taste, styptic; soluble in water. Incompatibles, the same as for sulphate of copper.

Effects.—Tonic and astringent; used chiefly in chorea and epilepsy. Dose, two to three grains. The *solution* an excellent application to inflamed mucous membranes; strength of the solution gr. j or grs. ij to fʒj of water. It is sometimes employed in combination with the acetate of lead.

Zinci Acetas, U. S. (*Acetate of Zinc.*)—Made by adding metallic zinc to a solution of acetate of lead. It is in white crystals, soluble in water; *used*, chiefly externally, as the sulphate.

Zinci Oxidum, U. S. (*Oxide of Zinc*).—Prepared by heating the precipitated carbonate. Not much used internally; sometimes externally as an ointment. The *impure oxide*, or *tutty*, is also used in the form of an ointment for excoriated surfaces.

Calamina Preparata, U. S. (*Prepared Calamine*—*Native Carbonate of Zinc*).—Used in the form of a cerate (*Turner's cerate*)—a good application to excoriated surfaces and certain cutaneous eruptions.

Sulphate of Cadmium has been lately introduced as an external application for the eye.

SILVER. (*Argentum*, U. S.)—ARGENTI NITRAS, U. S. (*Nitrate of Silver*—*Lunar Caustic*).—Prepared by the action of nitric acid on silver; evaporating, fusing, and running into moulds. Colour, nearly white; very soluble; taste styptic and harsh. Incompatibles, the same as for iron,—also common salt.

Effects.—Small doses are tonic; larger, corrosive and poisonous. Best antidote is common salt. Its long use is apt to occasion a discoloration of the skin. Most used in epilepsy and chorea; also in irritable conditions of the stomach. Dose, gr. ss to gr. ij, given in pill. Its solution is very valuable as a topical application to indolent ulcers, and to inflamed mucous membranes, as of the eye, nose, urethra, vagina, and rectum; strength of the solution from gr. ss to gr. x to fʒj of distilled water;—also for the throat and tonsils, either applied in strong solution, or in the solid form.

Argenti Oxidum, U. S. (*Oxide of Silver*).—Is made by action of potassa on the nitrate; used as the nitrate.

BISMUTH, (*Bismuthum*, U. S.)—BISMUTHI SUBNITRAS, U. S. (*Subnitrate of Bismuth*—*Magistery of Bismuth*).—Made by the action of nitric acid on bismuth, and then throwing the resulting nitrate into water, which throws down the subnitrate. A white powder, without taste or smell. Used chiefly in disorders of the stomach, connected with diseased innervation, as gastrodynia. Dose, three to ten grains. Apt to blacken the stools.

THE MINERAL ACIDS.

Usually classed among the tonics.

ACIDUM SULPHURICUM, U. S. (*Sulphuric Acid*).—Employed only in medicine in a state of solution. Acts as a tonic, astringent, and refrigerant; used in low forms of fever, and to check excessive perspiration. The dilute acid of the Phar. contains fʒj of the concentrated acid, to fʒxiiij of water; dose, 10 to 30 drops, in a wine-glass of water. The *elixir vitriol*, or aromatic sulphuric acid (*Acidum Sulphuricum Aromaticum*, U. S.), contains ginger and cinna-

mon; it is much used in the hectic fever of phthisis, and in convalescence from acute disorders. Dose, the same.

There is also an *ointment*.

ACIDUM NITRICUM, U. S. (*Nitric Acid*).—Is tonic and refrigerant; never used in its pure state; two kinds kept in the shops, the *nitric*, which is colourless, and the *nitrous*, which is reddish. Used as a tonic in low forms of fever. Dose, 2 to 10 drops, according to its strength. A strong solution is used externally to indolent ulcers. *Hope's mixture* consists of nitric acid, laudanum, and camphor water; used in dysentery, &c.

ACIDUM MURIATICUM, U. S. (*Muriatic Acid*).—Colourless when pure; used in a dilute form in low forms of fever, especially in typhus fever. Dose, 5 to 20 drops, in a wineglass of water. Used also as a gargle in scarlet fever.

ACIDUM NITRO-MURIATICUM, U. S. (*Nitro-Muriatic Acid*).—Made by mixing one part of nitric with two of muriatic acid; mutual decomposition ensues, by which nitrous acid fumes are given off, and chlorine remains dissolved in water. It is thought to have an especial tendency to the liver, and is given in hepatic diseases; also in secondary syphilis. Used likewise as a bath, or foot-bath, in these disorders.—The *solution of chlorine* sometimes used in bronchitis; also the vapour of chlorine inhaled, but is apt to occasion irritation.

Under the head of Tonics, *Cod-liver Oil* (*Oleum Morrhueæ*, U. S.) may be appropriately placed. It is procured from the fresh liver of the codfish, *Gadus Morrhua*, by pressure, or by spontaneous draining. Two or three varieties are found in the markets, the best of which is of a light-yellow colour, and transparent, and of a peculiar taste and smell. It contains some iodine and bromine, besides the usual fatty principles.

Effects, &c.—When used for some time it increases the function of nutrition; its influence is especially observable in chronic diseases of a wasting character, particularly in phthisis; given in the forming stage of the latter disorder, it has appeared in many cases to have arrested it. It is unfortunately liable to disorder the stomach. Dose $\text{f}\frac{3}{4}\text{ss}$ –j, two or three times a day. It is necessary to continue its use for two or three months.

CLASS III.

ARTERIAL STIMULANTS.

THESE are substances which increase the activity of the circulation, as a primary effect, though their operation is also generally extended to other parts of the system. They are sometimes named *excitants*, and, from their rapidity of action, *diffusible stimulants*. Many other articles, classed elsewhere, produce, among their other effects, stimulation of the heart and arteries, as opium, alcohol, ether, &c. They differ from *tonics* in their more powerful and rapid action; they do not, as tonics, increase the *power* of the system.

They are indicated in all cases of sudden or great prostration; but they should not be indiscriminately used, from fear of subsequent reaction. As a general rule, inflammation or fever contraindicate their use; but there may be cases in which they will be proper.

CARBONATE OF AMMONIA. (*Ammonizæ Carbonas*, U. S.)—Chemically a *sesquicarbonate*; improperly termed *volatile alkali*. Prepared by subliming together carbonate of lime and sal ammoniac. When first made it is a solid, white, transparent cake; odour, strong and pungent; taste, acrid and alkaline; soluble in water and alcohol; efflorescent on exposure, losing its stimulant properties.

Effects.—A powerful diffusible stimulant, acting chiefly upon the circulation; has a local tendency to the lungs and skin.

Uses.—Much employed in the sinking stages of fever, or of acute diseases; also in atonic gout, and dyspepsia attended with acidity of stomach; externally, to bites of poisonous insects. Dose, 5 grains every hour or two, given in solution with gum and sugar, to obtund its acrimony.

The *Aromatic Spirit of Ammonia* (*Spiritus Ammonizæ Aromaticus*, U. S.), is made by distilling together muriate of ammonia, carbonate of potassa, cloves, cinnamon, lemon-peel, alcohol, and water. It is an agreeable stimulant cordial, used in languor, faintness, and sick stomach. Dose, fʒss–ij.

The *Spirit of Ammonia* (*Spiritus Ammoniac*, U. S.), is only a solution of gaseous ammonia in dilute alcohol; it is not much used.

OIL OF TURPENTINE. (*Oleum Terebinthinæ*, U. S.)—Procured from common turpentine, which consists of the volatile oil and resin, by distillation. Called improperly *spirits of turpentine*.

Prop.—A colourless limpid fluid; odour, strong and peculiar; taste, hot and peculiar; rather lighter than water, with which it is

slightly soluble; its proper solvent is boiling alcohol. Chemically, a *hydrocarbon*; but when exposed to the air, absorbs oxygen, which converts part of it into resin.

Effects.—Small doses produce a warming, stimulating effect upon the stomach and the system generally, increasing the action of the heart and arteries. It is absorbed into the circulation, as proved by its being exhaled from the secretions. Apt to act upon the kidneys, sometimes with violence. Large doses act as a cathartic, and anthelmintic.

Uses.—A valuable stimulant, particularly in low forms of fever; more especially in *typhoid fever*, attended with dry tongue, delirium, tympanitis and subsultus. It is believed by some to produce an alterative impression upon the mucous membrane. Also in chronic catarrh, chronic dysentery, chronic nephritis, chronic gout and rheumatism; also in hemorrhages from the lungs and bladder. Dose, from 5 to 20 drops, given in emulsion, or dropped on sugar, and frequently repeated.

PHOSPHORUS is one of the most powerful of the stimulants, but is rarely employed. It appears to have an especial tendency to the genital organs, and is reputed aphrodisiac. It should never be used in substance, but in ethereal solution. Dose, one-twelfth of a grain.

CAYENNE, OR RED PEPPER. (*Capsicum*, U. S.)—The fruit of the *Capsicum annuum*, and other species; a native of the East and West Indies, but cultivated in our gardens. The fruit is in pods, 2 or 3 inches long, of a conical shape; colour, when ripe, bright red, which becomes darker by drying; colour of powder, red. The odour and taste of capsicum are peculiar, and depend on a fixed alkaline principle, named *capsicin*, also a pungent oil, and extractive. Alcohol and water extract its active properties.

Effects.—A powerful stimulant, especially irritant to the part to which it is applied.

Uses.—When a powerful local impression is required, as in rousing the action of the stomach; peculiarly applicable in malignant scarlet fever attended with putrid sore throat. A preparation consisting of two tablespoonfuls of powdered capsicum, one teaspoonful of common salt, half a pint of boiling vinegar, and half a pint of boiling water, is much used for this purpose in the West Indies. A saturated infusion may also be applied locally to the throat in gangrenous cases, with great benefit.

Dose of powder, 5 to 10 grains; of infusion (*Infusum Capsici*, U. S.), made with ʒij to Oss water—f ʒss; of the tincture, f ʒj to f ʒij. The strength of the gargle should be proportioned to the severity of the case.

CLASS IV.

NERVOUS STIMULANTS.

MEDICINES which stimulate the nervous centres, among their other stimulating operations. As they all probably first enter into the circulation, their impression is first made there.

One of the modes in which deranged nervous action most frequently manifests itself is *spasm*, and from the power of this set of remedies to control it, they have been termed *antispasmodics*. This term, however, is not strictly applicable to them, since spasm depends upon a diversity of pathological conditions, being sometimes produced by an excess of power in the nervous centres, and at others by a deficiency. Sometimes it is caused by congestion, or inflammation; in which cases the nervous stimulants would be inadmissible, but depletion would be required.

They are employed in all disorders connected with nervous derangements of any sort, not accompanied with high arterial action. Thus in hysteria, whooping-cough, spasmodic asthma, insomnolency, &c.

They all possess more or less of a fœtid odour, upon which their peculiar virtues were, at one time, supposed to depend.

MUSK. (*Moschus*, U. S.)—Product of the *Moschus moschiferus*, an animal somewhat resembling a deer, inhabiting the mountainous districts of Asia. The musk resides in an oval pod, about two and a half inches in length, and one and a half in breadth, situated between the prepuce and umbilicus. Musk is a secretion of the lining membrane of this pouch, and is found only in the male, and most abundantly in the adult animal. It is in the form of reddish-brown coarse granules, and, from its very high price, is extremely liable, to adulteration. Its chemical composition is very complex: it is inflammable.

Uses.—Musk, when genuine, is one of the most powerful of the antispasmodics. Given in full doses, it excites the circulation, as well as the cerebro-spinal system, producing an exhilarating effect, with occasional vertigo and headache; also slightly hypnotic. It is employed with advantage in retrocedent gout, obstinate singultus, infantile spasms not accompanied with inflammation, &c. Advantageously given to children in enema. Dose, 5 to 15 grs. Given in form of emulsion,—dose, f ʒi to f ʒij; of the *tincture*, gtt. xxx.

CASTOR. (*Castoreum*, U. S.)—A substance strongly resembling musk in its medicinal properties and therapeutical applications. It is the product of the *Castor Fiber*, or beaver, and is contained in two follicles situated near the anus of the animal. It contains a

peculiar matter called *Castorin*. Dose, gr. x-xx;—of the *tincture* (*Tinct. Castorei*, U. S.), gtt. xxx.

ASSAFŒTIDA, U. S.—A gum-resin—the product of the *Narthex assafœtida*, and possibly of some others. The *N. assafœtida* is an umbelliferous plant, growing in Persia and Afghanistan, having a long, tapering, perennial root, and very long leaves. Assafœtida is obtained by slicing off the top of the root, and collecting the juice as it exudes, which is then kneaded into masses, and packed for market.

At first it is rather soft, but hardens by exposure, which also renders it darker. Colour, externally, reddish-brown; internally, rather lighter, mottled with white tears, and shining; taste, bitter, acrid, and alliaceous; odour, very strong and alliaceous, but more powerful in the fresh juice. It softens by heat, and is inflammable. Chemically, it is a gum-resin, united to some volatile oil. Water dissolves the gum, which forms an emulsion with the resin; alcohol forms a clear, golden tincture.

Uses.—One of the most valuable of the antispasmodics; also stimulant, expectorant, and emmenagogue. Employed with advantage in hysteria, infantile convulsions, whooping-cough, chronic cough of a nervous character; also as a carminative, along with rhubarb and aloes, in the constipation of old persons, and as an emmenagogue. Advantageously given to children by enema, in which case it will often prove laxative.

Dose of substance, gr. v to x, given in form of pill;—of the emulsion (*Lac assafœtidæ*), f 3ss to f 3j;—of the tincture, f 3ss-j.

Assafœtida is sometimes used in the form of a plaster, in chronic swellings.

VALERIAN. (*Valeriana*, U. S.)—Root of the *Valeriana officinalis*, a perennial plant, indigenous in Europe, growing about two or three feet high. The root consists of a short tuberculated rhizome, from which issue numerous round, tapering fibres, of a yellowish-brown colour externally, and whitish internally. Taste, bitter and acrid; odour, when dry, strong, peculiar, and somewhat aromatic. It depends for its virtues on a yellow volatile oil, separable by distillation, and an acid, named *valerianic acid*.

Uses.—A mild antispasmodic and stimulant. Useful in hemiplegia, combined with cinchona; also in slight nervous derangements. Best given in form of *infusion* (*Infusum Valerianæ*, U. S.), made with half an ounce of the root to a pint of boiling water; dose f 3i to f 3ij. Dose of the *oil of valerian*, 3 to 5 drops;—of the *tincture* (*Tinct. Valerianæ*, U. S.), f 3j;—of the *ammoniated tincture* (*Tinct. Valerianæ Ammoniata*, U. S.),—made with the aromatic spirit of ammonia,—f 3ss; of the *fluid extract* (*Extractum Valerianæ Fluidum*, U. S.), gtt. x-xxx.

GARLIC. (*Allium*, U. S.)—Is decidedly antispasmodic, especially in cases of children, to whom it may be advantageously applied in the form of cataplasms to the feet, to quiet the nervous irritation to which they are frequently liable in the course of disease. Sometimes employed as a counter-irritant to the spine, in cases of whooping-cough. It is likewise expectorant.

OIL OF AMBER. (*Oleum Succini*, U. S.)—Amber is a fossil resin, the product, probably, of some extinct species of *coniferae*, found on the shores of the Baltic. It occurs in fragments usually of small size, of a yellowish colour, translucent, without odour, and inflammable. By destructive distillation it yields a volatile oil and *succinic acid*.

The oil, as first procured by distilling amber with sand, is thick, and of a very dark colour and empyreumatic smell; when purified by redistillation with water, it constitutes *Oleum Succini Rectificatum*, U. S.; this has a clear amber colour, and a less offensive odour; it is the only preparation used internally.

It is a decided stimulant to both the arterial and nervous systems; used chiefly in whooping-cough, infantile convulsions, obstinate hicough, hysteria, &c.; also as a rubefacient to the spine in infantile convulsions, and whooping-cough; and for rheumatism and palsy. It also increases the secretions, especially the urinary. Dose, gtt. v–xx, in emulsion.

The *Skunk Cabbage* (*Dracontium*, U. S. Sec.)—root of *Dracontium foetidum* (*Symplocarpus foetidus*), is a powerful nervous stimulant, especially in the fresh state. It deteriorates very much by age, and is hence not much used in regular practice. It has been employed with benefit in asthma. Dose, gr. x–xx.

Coffee and *Tea* possess decided virtues as nervous stimulants. The excessive use of either, especially of the former, is very apt to induce dyspepsia and its attendant evils. They may be beneficially resorted to as stimulants in nervous headache, and other mild nervous disorders.

CLASS V.

CEREBRAL STIMULANTS.

THIS class of stimulants acts chiefly upon the brain, though, at the same time, influencing both the circulation and the spinal nervous system. Like all other stimulants, their primary impression is followed by a proportionate degree of depression, which becomes excessive and dangerous, when the dose has been very large.

Their operation upon the system is usually described as consisting of three stages: 1, that of *stimulation*, which is transient; 2, that of *narcotism* or *sleep*, which is prolonged in proportion to the dose; 3, that of *depression*. The difference of these several stages of action have been ascribed to a supposed difference in their manner of operating; the immediate or stimulant effect being supposed to be due to action upon the nerves, while the narcotic depressing effects were attributed to a slower action, through absorption. They differ very much in their energy over the system, and are, by some, believed to act upon the different parts of the cerebral mass.

In large doses they are poisonous,—death resulting from asphyxia, in consequence of a suspension of the powers of the brain, or rather, of the medulla oblongata.

There is no class of remedies to which the system becomes so readily accustomed, and none in which such large doses can be tolerated, in especial diseases. Hence, when their use has to be continued, it is best to frequently substitute one for another, in order to prevent the formation of a dangerous habit. When once their use has become habitual, some degree of caution is requisite in abruptly withdrawing them, lest inordinate depression should follow.

They are used in medicine extensively for the relief of pain, which effect they accomplish by obtunding the sensibilities of the brain. Some are also employed for their stimulating effects; and many of them for an antispasmodic operation. They are, as a general rule, contraindicated in cases of plethora, fever of a high grade, and, especially, cerebral congestion or inflammation.

They have received different names according to their different effects; thus, *narcotics*, from their power of producing stupor; *anodynes*, from their ability to relieve pain; *soporifics* or *hypnotics*, from their tendency to promote sleep, &c.

ALCOHOL, U. S.—The product of a peculiar change in a saccharine liquid, known as the *vinous fermentation*. The conditions necessary for this change are a solution of sugar, the presence of some ferment, and a certain temperature. The chemical change which occurs is the conversion of sugar into alcohol and carbonic acid. The juices of various fruits contain all the elements for due fermentation. Thus the juice of the grape undergoes spontaneous fermentation, yielding *wine*; the juice of apples yields *cider*; the infusion of barley, *malt liquor*, &c. All such liquors—the result of fermentation—are named *fermented liquors*, and vary very much both as to flavour, and also as to the quantity of alcohol which they contain; thus the stronger wines contain about 20 per cent. of alcohol; the weaker wines about 10 or 12 per cent.; the malt liquors, as porter, ale, and beer, about 4 per cent. All the fermented

liquors when submitted to distillation afford much stronger products, called *distilled liquors*, *ardent spirits*, or *spirituous liquors*. Brandy, gin, rum, &c., are examples. These contain about 50 per cent. of alcohol. When the quantity is exactly 50 per cent., or one half, the liquor is termed *proof-spirit*.

Any of the distilled liquors, when submitted to distillation, will yield the *Alcohol* of the Pharmacopœia, called also *rectified spirits of wine*,—having a sp. gr. of .835. The alcohol thus procured contains as much as 15 per cent. of water, from which it cannot be entirely separated by any number of distillations. The *absolute alcohol* of chemists is never used in medicine.

The *Alcohol Dilutum* of the Pharmacopœias consists of equal measures of officinal alcohol and water: it is used in making certain tinctures; its strength is about that of the distilled liquors.

The various alcoholic liquors are used in medicine chiefly as stimulants in low states of the system. The *fermented* liquors, as wine, or the malt liquors, are usually preferred, unless a very decided stimulus is required, in which case *brandy* is employed.

Wine-whey is one of the best forms of administering wine; it is made by adding half a pint of wine (Madeira, Sherry, or Teneriffe) to a pint of boiling milk, separating the curd from the whey, and diluting the latter, if necessary, with rennet whey, and properly flavouring with sugar and spices.

The *malt liquors* may be employed as stimulants more freely than wine; they possess also tonic and nutritive properties: the best are porter and ale; beer is apt to prove aceseent.

Alcohol is frequently employed externally, particularly in the form of ardent spirits, as a rubefacient: the effect is increased by mixing with red pepper. It will act as a local refrigerant if applied so as to be allowed to evaporate.

An evidence of the favourable influence of alcohol in disease, is when, under its use, the pulse becomes fuller, and at the same time slower; the skin moist, with an abatement of delirium.

ETHER. (*Æther*, U. S.)—Chemically, the *oxide of ethyl*. Prepared by distilling together 2½ lbs. alcohol and 1½ lbs. sulphuric acid. The ether, as first procured, is contaminated with sulphurous acid, oil of wine, and some alcohol. It is purified from the acid by a redistillation with potassa; and from the alcohol by agitation with water. When thus purified it is named *rectified sulphuric ether*.

Prop.—A colourless limpid liquid, of a strong, agreeable, and peculiar odour; a hot, pungent taste; sp. gr. .7, or a little less. Water takes up one part in ten; very soluble in alcohol; very volatile and inflammable.

Its effects on the system resemble those of alcohol, only more rapid and transient. It will affect the brain, producing intoxication; and, like alcohol, its effects are diminished by frequent repe-

tion. Its impression is very speedily produced on the system by *inhalation*; by this means, a very powerful narcotic influence may be obtained. In this way it is much used as an anæsthetic agent.

As a medicine, ether is used chiefly as a powerful diffusive stimulant in cases of sudden and alarming prostration, as in metastatic gout, spasmodic asthma, angina pectoris, &c. It is best given in *emulsion*, made by rubbing it up with water by means of spermaceti. Externally applied it produces cold, if allowed to evaporate; or a rubefacient effect if confined to the skin.

Hoffman's Anodyne (*Spiritus ætheris compositus*, U. S.) is much employed. It contains oil of wine, ether, and alcohol, to the former of which it owes its peculiar fragrant odour, and which causes it to impart a milkiness to water; this is a test of its genuineness. It is much used to allay nervous irritations: it acts as an antispasmodic. Dose of ether, fʒss to fʒj;—of Hoffman's Anodyne, about the same.

CHLOROFORM. (*Chloroformum*, U. S.)—Prepared by distilling together alcohol, water, and chlorinated lime. It is the *terchloride of formyle* (C_2HCl_3). It is a very thin, colourless liquid, having a peculiar ethereal odour, and a hot, aromatic, saccharine taste, volatile, not inflammable, insoluble in water, soluble in alcohol and ether; sp. gr. 1.49; boiling point 142° ; remarkable for the very small size of its drop, requiring from 250 to 300 to make one fluid drachm.

Its action is that of a *direct sedative*; used as an anodyne and calmative both generally and locally. Much employed as an anæsthetic agent, but not without some danger; producing death apparently by suspending the heart's action. Dose, gtt. x-l. It has been found very useful in neuralgia.

OPIUM, U. S.—The concrete juice of the unripe capsules of *Papaver somniferum*, which is probably a native of Persia, but is now cultivated in various parts of the world. It is an annual plant, attaining the height of 2 to 4 feet. The flower consists of four large petals (Fig. 7). There are two varieties of the papaver somniferum, named the *white* and *black* poppy.

The *capsules* (poppy-heads) are about one and a half to two inches in diameter, of a yellowish-brown colour, and filled with small seeds, which contain much fixed oil of a bland character, but no narcotic principle. The capsules themselves are slightly narcotic, and are sometimes employed in the form of decoction and syrup.

Opium is procured by making incisions in the half-ripe capsules, and collecting the juice which exudes, and properly drying it. It is obtained in large quantities in India, Persia, and Asia Minor; the chief supply of commerce being afforded from the latter country.

The different sorts of opium are the *India*, *Persia*, *Turkey*, and *Egyptian*.—The India variety is almost exclusively consumed in India and China; it consists of three varieties, *Mulwa*, *Patna*, and *Benare's* opium. The Persian very seldom comes to this country.

Fig. 7.



There are two kinds of Turkey opium found in the markets,—the *Smyrna* and *Constantinople* opium.

Smyrna opium is, on the whole, the best; it comes in irregular rounded, or flattened cakes, covered with the capsules of some species of *rumex*, and enveloped in leaves; has a reddish-brown colour; a softish consistence in the centre; becomes darker and harder on exposure; has a strong narcotic odour.

Constantinople opium is seldom seen in our markets;—occurs in irregular flattened cakes, presenting the remains of a leaf on the exterior.

Egyptian opium comes in flat cakes about three inches in diameter, free from capsules; of a darker colour, and more mucilaginous than the *Smyrna* variety.

Marks of good opium are a strong narcotic odour, a bitter acrid taste, when long chewed, exciting irritation of the fauces and mouth; a reddish-brown colour; when drawn across white paper should leave an interrupted stain.

Opium is inflammable; it imparts its virtues to water and alcohol. *Chemical composition* very complex; most important ingredient is *morphia*;—contains also *narcotina* and *codeia*, which are alkaline principles; and *narceine*, which is neutral; also, *meconin*, *meconic acid*, *thebain* or *paramorphia*, *gum*, *extractive*, and a volatile principle.

Physiological Effects.—Those of a stimulant narcotic; it excites the circulatory and nervous systems, and in full doses affects the brain.

Its first impression is to stimulate the heart and arteries, as evidenced by an increased frequency of the pulse, and greater heat of skin. This is soon followed by diminished sensibility, calmness, and sleep, with abatement of pain, and suspension of mucous secre-

tions, except that of the skin. This is succeeded by a degree of prostration, evidenced by a feeble pulse, cool, moist skin, languor, and depression. In large doses it is a narcotic poison, the symptoms being stertorous breathing, a slow full pulse, great insensibility, and a livid countenance; followed by a feeble and threadlike pulse, relaxation of the muscles, and death. The *treatment* consists in an immediate evacuation of the stomach, either by the stomach-pump, or by a prompt emetic (zinci sulp. et ipecac.), counteracting the tendency to sleep by external irritation; arousing the sensibility by dashing cold water upon the face and chest; and supporting the system, when it begins to sink, with diffusible stimulants.

Therapeutical Applications.—Opium is employed in a great number of diseases; it is perhaps the very best *anodyne*, and is used for this purpose to relieve the pain of neuralgia, cancer, colic, &c. As a *hypnotic* or *soporific*, it is used in cases of morbid vigilance, except when dependent on inflammation of the brain. As a *stimulant* it is valuable in low forms of fever. As an *antispasmodic*, it controls spasm more effectually than most other remedies; in tetanus very large doses are required. As a *diaphoretic* it is useful in bowel affections, typhoid pneumonia, rheumatism, &c. It is also employed to arrest morbid discharges. On certain constitutions it produces peculiar effects, as obstinate wakefulness, nausea, delirium, and a tingling of the skin, attended with a miliary eruption.

The average dose of opium is one grain; but in mania-à-potu and tetanus, enormous doses are required. It may be applied *endermically* with advantage, in cases where the local effects are required; also by enema.

The following preparations are officinal in the United States Pharmacopœia :

Tinctura Opii (Laudanum—Thebaic tincture).—Prepared by macerating opium, ℥ijss in diluted alcohol, Oij. It is a saturated tincture, and should always be of uniform strength. It contains about 37 grains to the fluid ounce. When long kept its strength is increased by the evaporation of the alcohol, in which case danger might result from administering it to infants. The dose equivalent to a grain of opium is ℥xiiij, or 25 drops. Laudanum is frequently used as an external application.

Tinctura Opii Camphorata (Paregoric Elixir).—Prepared by the action of dilute alcohol on opium, benzoic acid, camphor, oil of anise, and honey. It contains two grains of opium in every fluid-ounce. It is much used in diarrhœa and coughs;—dose, about f℥j; 18 drops equivalent to one of laudanum.

Tinctura Opii Acetata (Acetated Tincture of Opium).—Prepared by macerating opium in alcohol and vinegar combined;—dose, ℥xx.

Acetum Opii (Black Drop).—Prepared by macerating opium,

nutmeg, sugar, and saffron in dilute acetic acid. It is a strong preparation;—dose, 7 to 10 drops.

Vinum Opii (*Wine of Opium*).—Made by macerating opium and some of the aromatics in wine;—dose, $\text{ʒ} \times$.

Morphiæ Sulphas (*Sulphate of Morphia*).—Prepared by acting on a strong watery infusion of opium, with ammonia, which combines with the meconic acid, precipitating the morphia in a crystalline state; purified by boiling alcohol, and separated from the narcotina by means of ether. By these means the morphia is obtained in a crystalline state; it is next neutralized with sulphuric acid. It occurs in fine needle-shaped crystals, freely soluble in water;—dose, $\frac{1}{6}$ – $\frac{1}{4}$ grain. The solution is officinal, (*Liquor Morphiæ Sulphatis*, U. S.) It contains one grain to $\text{f} \text{ } 3\text{j}$ of water;—dose, $\text{f} \text{ } 3\text{j}$ – ij .

The *hydrochlorate* and *acetate* of morphia are also used; their properties are similar to those of the sulphate.

The best tests for the presence of morphia are the *sesquichloride of iron*, which causes a blue colour; and *nitric acid*, which strikes a blood-red tint.

The salts of morphia are much employed *endermically*; they possess all the valuable properties of opium.

LACTUCARIUM, U. S.—The inspissated juice of the *Lactuca sativa*, or *garden lettuce*, which abounds in a milky juice, especially at the period of flowering. It is prepared by pressing out the juice with water, and evaporating to a proper consistence. It is of the consistence of a dry extract, of a brown colour, and strongly resembles opium in its effects, except that it does not produce constipation, nor diminish the secretions. Its dose is from two to five grains.

CAMPHOR. (*Camphora*, U. S.)—Product of the *Camphora officinarum*, or the *Laurus camphora* of Linnæus, an evergreen tree, of considerable height, growing in China and Japan. All parts of the tree abound in the odour and taste of camphor, but this is yielded in greatest abundance by the roots and young branches, when they are cut up, boiled in water, and sublimed into inverted straw cones. Thus obtained, it constitutes the *crude camphor* of commerce. It is purified by resublimation, along with quicklime, when it becomes *refined camphor*.

Fig. 8.



It is solid, colourless, and translucent, with a crystalline texture, tough and difficult to pulverize; has a strong penetrating odour, with a bitter pungent taste, followed by a sense of coolness; rather

lighter than water; very volatile and inflammable; but slightly soluble in water; very soluble in alcohol, ether, the fixed and volatile oils.

Borneo or *Sumatra* camphor is in white crystalline fragments; it occurs in solid masses in the cavity of the wood of the *Dryobalanops camphora*.

Effects on System.—In moderate doses, it produces a gentle excitement, heat of skin, and fulness of pulse, with a tendency to diaphoresis. Large doses prove narcotic. Sometimes it seems to act as sedative. It is applicable in typhoid cases, accompanied with nervous derangement. It is sometimes usefully combined with opium, in rheumatism, &c.

Dose, in substance, from 5 to 10 grains. The *emulsion* is made by rubbing up the camphor with gum, sugar, myrrh, and water.

Aqua Camphoræ, U. S. (*Camphor Water*)—is made by adding a few drops of alcohol to camphor, and then rubbing up with carbonate of magnesia and water; it contains 3 grains to every fluid-ounce.

Tinctura Camphoræ, U. S., often called *Spirits of Camphor*, contains two ounces of camphor to the pint of alcohol;—chiefly employed as an embrocation to sprains and bruises; used internally in colic and cholera;—dose, 5 drops to fʒj.

Linimentum Camphoræ, U. S. (*Camphor Liniment*)—consists of camphor dissolved in olive oil; used as a mild embrocation.

Tinctura Saponis Camphorata, U. S., improperly called *Soap Liniment*,—made by mixing together camphor, Castile soap, oil of rosemary, and alcohol. It is a yellowish oleaginous liquid, much used as a stimulant anodyne lotion in sprains, rheumatism, &c.

Linimentum Saponis Camphoratum, U. S., commonly known as *Opodeldoc*,—made like the last-mentioned preparation, except that an animal soap is used instead of a vegetable one, in consequence of which it coagulates on cooling, and yields a soft solid, which liquefies at the temperature of the body;—uses, the same as the others.

Hops. (*Humulus*, U. S.)—The *Humulus lupulus* (Fig. 9), is a native of Europe and North America. It has a perennial root, which sends up annually several rough, flexible, twining stems. The male and female flowers grow on different plants. The part used is the flowers, or rather strobiles, which are collected when ripe, dried, and packed in bales. They have a greenish-yellow colour; a bitter, astringent, and somewhat aromatic taste; impart their virtues to water and alcohol. A reddish powder is found at the base of the scales, termed *lupulin*, which contains all the virtues of the hops. These virtues depend upon a peculiar principle called *lupulina*, which resides both in the hops and in the powder.

Effects on System.—Stomachic, tonic, and slightly narcotic. The

odorous emanations from hops are hypnotic; for this purpose the *hop-pillow* is employed, made by previously moistening the hops with spirits, to increase the effect, as well as to prevent a rustling noise. Hops are extensively employed in making malt liquors. They are best given in the form of infusion (*hop tea*), made in the

Fig. 9.



proportion of ℥ss to Oj water. The decoction and extract are objectionable. Lupulin may be given in the dose, 6 to 12 grains, made into a pill. The tincture of lupulin (*Tinc. Lupulinæ*) is official, as well as the tincture of hops (*Tinc. Humuli*). They are excellent remedies in the dyspepsia of drunkards, and in mild mania-à-potu;—dose, f℥ss to f℥j . Hops are sometimes applied externally, in the form of poultice; it has an anodyne effect.

BITTERSWEET. (*Dulcamara*, U. S.)—It is doubtful whether this medicine should have a place among the narcotics, since its influence over the cerebral functions is very feeble. The plant yielding it is

the *Solanum dulcamara*, or *woody nightshade*; the parts employed are the stem and twigs, which should be collected in the autumn. They are about the thickness of a common quill, of a light brownish-gray colour, without odour, and have a bitter taste followed by sweetness.

Uses.—Their chief employment is as an alterative in chronic skin diseases, given in the form of decoction (*Decoctum Dulcamaræ*, U. S.), made by boiling 3j in Ojss of water down to Oj. It may also be used in the same cases advantageously as a wash. Its virtues depend on an alkaline principle named *solania*, which is also found in the *Solanum tuberosum*, or common potato.

Dulcamara has been supposed by some to be antaphrodisiac, and for this purpose has been employed in the cases of the insane.

Extractum Dulcamaræ, U. S.—Dose, gr. v–x.

HENBANE LEAVES AND SEEDS. (*Hyoscyami Folia et Semen*, U. S.)—Leaves and seeds of the *Hyoscyamus niger*, a biennial plant (Fig. 10), native of England, growing from one to three feet high; thickly furnished with sessile leaves, of a pale-green colour. All parts abound in narcotic properties, but the leaves and seeds alone are officinal. The leaves of the second year, and of plants grown in sunny situations, are said to be the strongest. They ought to have a mucilaginous, slightly bitter taste, and should retain some of the narcotic odour of the plant. They depend for their virtues upon a peculiar crystalline, alkaloid principle, named *hyoscyamia*; this is yielded to water and alcohol.

Effects.—Very slightly, if at all, excitant; narcotic, anodyne, and soporific; resembles opium in moderate doses, except that it does not constipate. Large doses occasion dizziness, dilatation of the pupil, and slight delirium. It may be used in cases requiring the exhibition of a gentle anodyne and calming remedy. It is given in powder,—dose, 5 to 10 grains; in extract (inспissated juice), (*Extractum Hyoscyami*, U. S.)—dose, ½ gr. to 3 grains; in alcoholic extract—prepared by percolation with alcohol on the dried leaves, and evaporating to a proper consistence,—dose, gr. ij; in tincture,

Fig. 10.



—dose, f3ss-j. The preparations of hyoseyamus, as found in the shops, are very variable.

THORNAPPLE LEAVES AND ROOT. (*Stramonii Folia et Radix*, U. S.)—The *Datura stramonium* (Fig. 11), is an annual, very common in different parts of the world, growing from 3 to 6 feet high. All parts are acrid and narcotic, but the leaves and seeds only are used in medicine. These owe their efficacy to a very poisonous peculiar principle, called *daturia*.

Fig. 11.



Effects.—A strong acrid narcotic; diminishes sensibility, causes cerebral disturbance, as manifested by giddiness, headache, dilatation of the pupil, and obscurity of vision; also, calmative and antispasmodic; occasionally will produce diaphoresis and diuresis.

Used,—in neuralgia, rheumatism, epilepsy, and mania; also in spasmodic asthma, where it is employed by smoking the dried leaves or root in a common pipe; caution is required in the case of the aged or plethoric. Given in *powder*—dose, 2 or 3 grains; in *seed*—dose, one grain twice a day; *extract of the leaves* (*Extractum Stramonii Foliorum*, U. S.),—dose, one grain twice a day; *extract of the seeds* (*Extr. Stram. Seminis*, U. S.),—an alcoholic extract—dose, $\frac{1}{4}$ to $\frac{1}{2}$ a grain.

The extract is sometimes used by American oculists to dilate the pupil of the eye previous to the operation for the cataract.

The ointment (*Unguentum Stramonii*, U. S.) is best made by boiling the fresh leaves in lard: it has a light-green colour, and may be employed in the same cases as the belladonna ointment.

DEADLY NIGHTSHADE. (*Belladonna*, U. S.)—The *Atropa belladonna* (Fig. 12) is an herbaceous perennial plant, a native of Europe. It has a thick fleshy root, several downy, erect stems; ovate, entire leaves, and pendent, bell-shaped, purplish flowers. All parts are possessed of narcotic properties, though only the leaves are official. The dried leaves have a dull-greenish colour, a slight narcotic odour, and a bitter nauseous taste. Active principle, *atropia*, a violent poison.

Effects, &c.—Anodyne, antispasmodic, and rather sedative; one of its earliest impressions is a dryness and stricture of the fauces; it often causes dilatation of the pupil, giddiness, dimness of vision; in large doses, great thirst, dysphagia, violent delirium, blindness, and occasionally convulsions, coma, and death. Its fatal effects are usually accompanied with marks of gastro-intestinal inflammation.

Uses.—As an anodyne, to relieve the pain of neuralgia; as a resolvent or discutient in chronic indurations; as an antispasmodic in the latter stages of whooping-cough; by some supposed to be a prophylactic in scarlatina. Externally applied, it produces a local anodyne impression; and if applied to the eyes, it causes dilatation of the pupil, for which purpose it is frequently used by the oculist. It is employed in substance, infusion, and extract. Dose of powder, one grain twice a day; of the extract—an inspissated juice— $\frac{1}{4}$ of a grain to one grain.—*Extract. Belladon. Alcoholicum*, U. S., dose the same. The dose in each case is to be increased until dryness of the throat is produced.

Fig. 12.



Emplastrum Belladonnæ, U. S.,—made by mixing the extract with lead plaster—is used to relieve neuralgic pains; also in dysmenorrhœa.

Unguentum Belladonna, U. S.,—made by rubbing up $\mathfrak{z}\text{i}$ of the extract with $\mathfrak{z}\text{i}$ of lard. Used to painful or sprained joints, and sometimes applied to the rigid os uteri in cases of protracted labour; used also for dilating the pupil for the operation of cataract.

The three last-mentioned narcoties, from their tendency to produce delirium, have been sometimes named *Delirifacients*.

EXTRACT OF HEMP. (*Extractum Cannabis*, U. S.)—The plant which yields this medicine is the common hemp (*Cannabis sativa*, var. *Indica*), a native of Persia, but cultivated throughout the world. It secretes a peculiar resinous matter, which is much more abundant in the plants grown in India than in those of Europe or America. This resin is sold by the natives under the name of *cherrus*. In the East, the dried flowering tops, from which the resinous matter has not been removed, is also employed under the name of *gunjah*.

The active principle is a resinous matter, called *cannabin*, soluble in alcohol and ether; also a volatile oil.

Effects on the System.—It exhilarates the spirits, increases the appetite, alleviates pain, produces sleep, and is stated to act as an aphrodisiac. In large doses it occasions delirium of a peculiar character, attended with a cataleptic condition. Dr. Pereira says, that, in his hands, its effects very much resembled those of opium.

Uses.—In India it has been employed with great benefit in tetanus, hydrophobia, rheumatism, and cholera; its operation being chiefly directed to the relaxation of spasm. It has not been so successful in Europe or America.

The *extract* is made by boiling the dried flowering tops (*gunjah*) in alcohol until the resin is dissolved out, and then distil off the spirit; *dose*, gr. j–v. The *tincture* (made by dissolving three grains of the extract in a fluid drachm of diluted alcohol), is sometimes employed.

CLASS VI.

EXCITO-MOTOR STIMULANTS.

THIS class of stimulants produce their effects through *reflex action*,—that is, by so impressing the spinal cord as to excite the anterior or motor centres into action, and consequently to produce muscular movements. These may frequently be of a spasmodic character, and even amount to general convulsions.

As remedial agents, they are employed where it becomes necessary to arouse the muscular structure into action, though usually in cases of local or temporary torpor, as in partial paralysis, or in inertia. Some of them possess decided narcotic properties.

NUX VOMICA, U. S.—Seeds of the *Strychnos nux vomica*, a middling-sized tree, growing in the East Indies. The fruit is a berry about the size of an orange, containing many seeds imbedded in a juicy pulp. These are rather less than an inch in diameter, circular and flattened, slightly concavo-convex. Externally they are covered with a whitish silky down. The interior is hard, of a horny consistence; difficult to powder. They have no odour, but an intensely bitter taste; they yield their active principle to dilute alcohol more readily than to water.

Nux vomica owes its virtues to two alkaline principles which it contains, called *strychnia* and *brucia*, which exist in combination with *igasuric acid*.

Strychnia may be procured either from nux vomica, or from *St. Ignatius' bean*, which contains it in large quantities. As found in the shops it is usually granular, but it may be made to crystallize. Colour, white; no odour; taste, intensely bitter; almost insoluble in water; soluble in alcohol; slightly so in ether; unites with acids to form salts. *Brucia* is found in *false Angustura bark*; its properties are similar to those of strychnia, though feebler.

Effects on System.—Given in very small doses it acts as a tonic to the digestive organs; in rather larger quantities, its influence seems to be directed chiefly to the muscular system, through the medium, however, of the spinal marrow. There is, at the same time, an increased sensibility to external impressions, trembling of the limbs, and slight convulsive motions, which subsequently extend to the involuntary muscles, producing, in poisonous doses, the most violent tetanic spasms; the individual perishes apparently from asphyxia, brought on by the spasm of the respiratory muscles. There is no narcotism, nor is the pulse much affected.

There is strong reason for believing that the peculiar impression of the medicine is exerted entirely through the medium of the spinal marrow, and not through the medium of the brain.

Uses.—The cases which would seem most obviously to be met by nux vomica, or strychnia, are those attended with deficient nervous energy, as indicated by a torpid or paralytic condition of the muscles. The cases of paralysis to which it is applicable are such as are not attended with organic lesion of the brain. It is said to be more advantageous in paraplegia than in hemiplegia; also in local palsies, and in incontinence of urine, depending on a loss of power of the muscles of the bladder. The first obvious sign of its influence on the system, in cases of paralysis, is a tingling sensation experienced in the part affected.

Dose of the *powder*, 5 grs. three or four times a day, gradually increased until a sensible effect is produced. A better form is the *alcoholic extract* (*Extrac. Nucis Vomicae*, U. S.), the dose of which is from half a grain to two grains. The *tincture* (*Tinc. Nucis Vomicae*, U. S.) is made in the proportion of ℥iv to the pint; dose, gtt. x-xx.

Dose of strychnia, $\frac{1}{12}$ th to $\frac{1}{4}$ th of a grain, three times a day.

Strychnia may be applied *endermically* in cases of amaurosis, when not of an organic character,—half a grain being sprinkled upon a blistered surface on the temple.

ERGOT. (*Ergota*, U. S.—*Spurred Rye*.)—A diseased product of the *Secale cereale*, or common rye, caused by a fungous parasite,—in the form of numerous sporidia, visible by the microscope. This fungus, when lodged upon any of the *grasses*, will produce the diseased condition of the seed called *ergot* or *spur*. Rye grown upon poor and wet soils is most subject to it. Occurs in spurred grains from half an inch to an inch in length, cylindrical, tapering, and curved like a cock's spur; colour, externally purplish-brown; internally, dull white; odour, in mass, resembling that of putrid fish; taste, acrid and unpleasant;—virtues to boiling water and alcohol. It contains an oil and *Ergotine*.

Effects.—In the ordinary dose it occasions no perceptible effects on the male system; but on the female it produces decided uterine contractions, particularly in the impregnated condition; and these contractions are of a *tonic* nature. It also sometimes produces nausea, giddiness, and stupor, indicating a narcotic influence.

Ergotized grain, used for a length of time, has been known to produce fatal effects—such as dry gangrene, typhus fever, and convulsions.

Uses.—Chiefly to facilitate labour; but *only* when the delay arises simply from a want of contractile power of the uterus;—also to aid in the expulsion of the placenta, and of clots, hydatids, and polypi; also in uterine hemorrhage.

Dose of powder, \mathfrak{ij} ,—to be repeated if necessary. *Infusion*, made with \mathfrak{zj} of ergot to f℥iv boiling water; dose, one-third. *Vinum Ergote*, U. S.,—dose, f℥j to f℥iij . Ergot should not be kept in the powdered state.

CLASS VII.

ARTERIAL SEDATIVES.

MEDICINES which tend directly to depress the action of the circulation; producing a slower and weaker pulse, and diminishing the

frequency of the respirations, without any special tendency to the nervous system.

They have also been named *refrigerants*, from the cooling effect generally produced upon the surface of the body by their use, owing to a diminished capillary circulation.

They are indicated in cases of high vascular action, as the different phlegmasiæ, and fevers unaccompanied with typhoid symptoms. Although *sedative* in their general impression upon the system, some of them, as antimony, produce a local stimulant effect upon some of the organs.

They cannot be employed as substitutes for bloodletting, since the latter actually takes away materials from the circulating fluid; but they are valuable adjuvants to this treatment, and are much employed with this view.

ANTIMONY. (*Antimonium*, U. S.)—The antimonials are the most sedative of all the refrigerants, and are used very extensively with this indication. Given in quantities too small to produce any obvious effect in the healthy system, they nevertheless prove *alterative* in disease. In rather larger doses, though still too small to occasion nausea, they produce a decided sedative action. In still larger doses, they cause nausea, thereby directly increasing their power as sedatives or refrigerants. In yet larger quantities they vomit. Although sedative to the system at large, the antimonials act as stimulants to the lungs, skin, and kidneys, and sometimes the liver and salivary glands. They act by being taken up by the circulation. Their effects continue for some time after the suspension of their use, and by cautiously increasing the dose, great *tolerance* of the medicine may be induced.

The preparations of antimony most used are the following:—

1. *Tartar Emetic.* (*Antimonii et Potassæ Tartras*, U. S.)—Prepared by saturating the excess of acid in the bitartrate of potassa (cream of tartar), with the sesquioxide of antimony, by boiling them together. It should always be crystallized, to free it from impurities.

Prop.—A white, crystalline salt, without odour, of a nauseous, metallic taste, efflorescent, very soluble in water, insoluble in pure alcohol; decomposed by the pure alkalies, alkaline carbonates, and the vegetable astringents.

Effects and Uses.—The best of the antimonials; used as an alterative in chronic cutaneous diseases, and in serofulous affections; but requires to be persevered in for some time. Dose as an alterative, $\frac{1}{32}$ to $\frac{1}{16}$ gr. In rather larger quantities, as from $\frac{1}{12}$ to $\frac{1}{6}$ gr., it acts as a refrigerant, and may be given whenever the action is above the normal standard, as in fevers, inflammations—especially of the lungs,—when it acts also by increasing the secretion. It

has been given in very large doses in acute pneumonia and other pectoral diseases, on the *contra-stimulant* plan of Rasori, as a substitute for the lancet, the patient taking from one to two grains, and upwards, every two hours. There is considerable risk, however, in this method, arising from the excessive depression which is sometimes produced, and also from the effect on the stomach and bowels.

The *poisonous* effects are an austere, metallic taste, excessive nausea and vomiting, burning pain in the stomach, colic, extreme depression of the circulation, spasms, watery evacuations from the bowels, and great prostration; resembling very much a violent case of cholera. The remedies are demulcent drinks, astringent infusions, and stimulants, both internal and external.

Antimonial Wine. (*Vinum Antimonii*, U. S.)—A solution of tartar emetic in wine, in the proportion of gr. ij to f 3j. The best wine must be used—as the Tencriffe, Sherry, or Madeira, or else the solution will not be perfect. This preparation is employed for its diaphoretic and expectorant effects; also as an emetic for children. Dose 20 drops to f 3j.

Tartar Emetic Ointment. (*Unguentum Antimonii*, U. S.)—Made by rubbing up 3ij of powdered tartar emetic with 3j of lard. Used to the skin as a counter-irritant by its pustulation, in chronic internal disorders of the chest or abdomen.

2. *Precipitated Sulphuret of Antimony.* (*Antimonii Sulphuretum Precipitatum*, U. S.)—Prepared by boiling together the ter-sulphuret of antimony and a solution of potassa; strain, and add sulphuric acid while yet hot; then wash away the sulphuret of potassium, and dry the precipitated sulphuret. It is an orange-red, insoluble powder, composed, chemically, of a mixture of the oxide and sulphuret of antimony.

Kermes Mineral is a similar compound, made like the preceding, with the exception that no acid is added, but the precipitate falls spontaneously.

Golden Sulphur of Antimony is formed by adding an acid to the liquid, after the precipitation of the Kermes mineral: it contains some uncombined sulphur.

None of these preparations are much used at present. They are occasionally given as alteratives, combined with guaiac and calomel, in the form of *Plummer's Pill*, in chronic skin diseases. Dose, 1 to 2 grs.

3. *Antimonial Powder* (*Pulvis Antimonialis*), made in imitation of *James's Powder*.—Prepared by burning the sulphuret of antimony with hartshorn shavings, in a wide-mouthed vessel. It consists of phosphate of lime and oxide of antimony; colour, white; no taste or smell; insoluble in water; uncertain in its operation. Used in fevers and cutaneous diseases. Dose, 3 to 8 grs.

VEGETABLE ACIDS.

Nearly all of them are refrigerant, and are well adapted, when properly diluted, to inflammatory and febrile complaints. Too long used, they enfeeble digestion, and produce symptoms of marasmus. Those most employed in medicine are the Acetic, Citric, and Tartaric.

ACETIC ACID—(*Acidum Aceticum*, U. S.)—in the form of vinegar, diluted with water, is a refreshing drink in febrile cases. It is also useful as a cooling application to the surface. The strong acetic acid is an irritant poison. Dilute acetic acid and distilled vinegar are of about equal strength.

CITRIC ACID—(*Acidum Citricum*, U. S.)—exists in the lemon, lime, sour orange, tamarind, and many other fruits. It is used either in the form of lemon-juice, or the solid crystalline state. The decomposition of lemon-juice may be partially prevented by exposing it to a freezing temperature, whereby all the watery parts are separated, and the juice much concentrated; or by making it into a syrup with sugar.

The crystalline acid is prepared by saturating lemon-juice with chalk, and then decomposing the citrate of lime by sulphuric acid, and evaporating. The crystals are large, white, transparent rhombs, of a very sour taste, soluble in water; apt to be adulterated, if in powder, with tartaric acid; fraud detected by carbonate of potassa, which causes no precipitate with citric acid. A solution in the proportion of ℥i℥ss citric acid to Oj water, is about the strength of lemon-juice; ℥j of acid to Oj water is the proportion for lemonade. It is a valuable *antiscorbutic*.

TARTARIC ACID—(*Acidum Tartaricum*, U. S.)—is found in the juice of the grape, tamarind, &c. It is much employed as a cheap substitute for citric acid.

SALINE SUBSTANCES.

Most of the neutral salts produce a refrigerant effect upon the system, both as a direct result, and indirectly, in consequence of the purgative power which many of them possess. Most of them are described under the head of *Cathartics*. The one most especially refrigerant, is

NITRATE OF POTASSA (*Potassæ Nitræ*, U. S.), commonly called *Saltpetre*, or *Nitre*. It is procured from the banks of the Ganges, as a natural exudation from the soil; also from artificial nitre-beds in Europe. When purified, the crystals are large, six-sided prisms, with numerous transverse striæ; no odour; taste, saline and cooling; soluble in water, not in pure alcohol; fuses by heat, when it

may be run into moulds; a high heat decomposes it. *Effects*.—In moderate doses, it reduces the circulation, and diminishes the temperature of the body, not, however, as was supposed, by its solution in the stomach. It probably exerts some chemical influence on the blood, rendering it less inflammatory. At the same time, it is diuretic, or diaphoretic, according as the patient is kept cool or warm. Large quantities are apt to produce nausea and vomiting, and even poisonous effects; though very considerable doses may be taken with impunity, provided they be given largely diluted in some mucilaginous fluid.

Used in fevers of a high grade, as an adjuvant to the lancet; also very useful in hemorrhages, and in all inflammations, except those of the stomach and bowels. Often combined with tartar emetic, and sometimes with calomel. Dose, 5 to 10 grs. every hour or two. The *Nitrous Powders* consist of a combination of nitre, tartar emetic, and calomel,—much employed in febrile complaints of a bilious character.

CLASS VIII.

NERVOUS SEDATIVES.

THESE are medicines which occasion great depression of the system, attended often with nausea, sometimes with vomiting and purging, weakness and irregularity of pulse, syncope, giddiness, confused vision, and occasionally convulsions, delirium, and stupor. They are named by some writers *sedative narcotics*, from their effects on the brain. The most important of this group are Foxglove and Tobacco.

FOXGLOVE. (*Digitalis*, U. S.)—The *Digitalis purpurea* is a biennial plant with long radical leaves, from the midst of which an erect stem arises the second year, terminated by a raceme of beautiful purple flowers. The parts used in medicine are the leaves, which require to be selected and dried with great care, and preserved so as to exclude the light. When dried they should have a fine green colour, a slight odour, with the strong bitterness of the recent plant. They contain a peculiar principle termed *digitalin*, on which their activity depends.

Effects on System.—Those of a sedative narcotic; causes tightness and dull pain in the forehead, vertigo, dimness of vision, confusion of intellect, great reduction of the heart's action—in some cases as much as 30 pulsations a minute. It is also powerfully diuretic. Poisonous doses produce nausea and vomiting, great

prostration, cold sweats, hiccough, convulsions, and death. It is cumulative in its action, and therefore its effects require to be carefully watched.

Digitalis is chiefly used to diminish the action of the heart in hypertrophy and dilatation of that organ, also in certain forms of nervous palpitations; in aneurism of the aorta; in inflammation, as an adjuvant to the lancet; in scarlatina, pertussis, epilepsy, mania, and some forms of hemorrhage; also as a diuretic. Dose in substance gr. j, two or three times a day; of the *infusion* (*Infusum Digitalis*, U. S.), made by adding ℥ij to Oj of water, f ℥ss; of the *tincture* (*Tinc. Digitalis*, U. S.), ℞x to ℞xxx.

TOBACCO. (*Tabacum*, U. S.)—Leaves of the *Nicotiana tabacum*, an annual plant, native of tropical America. It has an erect, hairy stem, long sessile leaves, viscid and hairy. As found in the shops it is of a yellowish-brown colour; strong, narcotic, penetrating odour; bitter, acrid, and nauseous taste. Alcohol and water extract its virtues. Its active principle, named *nicotina*, is a volatile, alkaline, oily liquid, without colour, with a very acrid taste, and an odour resembling that of tobacco; it is extremely poisonous. Tobacco contains another principle named *nicotianin*, a fatty substance, seeming to owe its properties to containing a little nicotina. An *empyreumatic oil* is yielded by the destructive distillation of tobacco; it gives the peculiar odour to old tobacco-pipes; it is very poisonous.

Effects on System.—In very small quantities, it is a sedative to the system at large; in larger doses, acts on the brain, producing vertigo and stupor, together with nausea and vomiting, extreme depression, coldness of the skin, syncope, and sometimes convulsions. Small doses repeated are more dangerous than a large one, in consequence of the latter being rejected from the stomach. In its effects, it resembles digitalis, surpassing it, however, in its depressing influence over the muscular system, but being inferior to it in its influence over the circulation.

Uses.—Chiefly to relax the muscular system, as in strangulated hernia, obstinate constipation from spasm of the bowels, or retention of urine from spasm of urethra. Not much given by the stomach on account of the excessive nausea it produces; chiefly by *enema* (infusion, made in proportion of ℥j tobacco to Oj of water,—one-half to be used at once). Dangerous and even fatal symptoms have resulted from the tobacco injection. It may also be used in the form of cataplasm, in cases of spasmodic croup, lead colic, tetanus, and rheumatic affections.

Wine. (*Vinum Tabaci*, U. S.)—Used as a nauseant and diuretic.

Tobacco ointment (*Unguentum Tabaci*, U. S.), is made by boiling fresh tobacco in lard; it is used in cutaneous diseases, especially *tinea capitis*. The ointment is sometimes made from the oil.

INDIAN TOBACCO. (*Lobelia*, U. S.)—The *Lobelia inflata* is a native of America, where it was employed as a medicine by the aborigines. It is an annual plant, growing a foot or more in height, with an erect stem; the fruit is an inflated capsule. The whole shrub is used in medicine. It contains a volatile, acrid, peculiar principle, named *lobelina*, analogous to *nicotina*.

Effects.—Narcotic, acrid, emetic, and antispasmodic, strongly resembling those of tobacco. It is chiefly used as an antispasmodic in asthma, either by giving it in full doses so as to excite vomiting, or in small quantities frequently repeated till nausea comes on. Its infusion may be used in the form of enema in strangulated hernia. Used internally chiefly in the form of *tincture* (*Tinc. Lobelise*, U. S.),—dose, fʒj. Fatal effects have followed the empirical administration of lobelia.

ACONITE. (*Aconitum*, U. S.)—Leaves and root of the *Aconitum napellus*, or monkshood, a perennial herbaceous plant, growing in the mountainous parts of Europe. The root is tapering; leaves deeply divided; flowers of a dark-blue colour. All parts are possessed of acrid properties, and when fresh, emit a faint narcotic odour. *Taste* of the leaves and root, at first bitterish and acrid, and followed by a peculiar tingling sensation, often amounting to numbness, which extends to the soft palate.

Effects.—Those of a sedative narcotic, or rather of a *benumber*, since it diminishes sensation, causes a feeling of numbness and tingling along the extremities, muscular debility, contraction of the pupil, but no delirium or stupor. Poisonous doses cause excessive burning and numbness of the mouth, throat and stomach, with violent vomiting, prostration, great loss of sensibility, but neither coma nor convulsion. It differs from tobacco and digitalis in not producing stupor or giddiness, as a general rule. It yields its virtues to alcohol. Its peculiar properties depend upon an alkaline principle termed *aconitia* or *aconitina*; there is also a volatile acrid principle, besides some extractive, &c.

Aconitia is a white solid substance, existing in combination with an acid. It possesses all the powerful properties of the plant in a highly concentrated degree. In fact, when pure, it is as subtle a poison as prussic acid; though much of the alkaloid sold in the shops is worthless. Its very high price forms an objection to its use. The *alcoholic extract* of aconite (*Extr. Aconiti Alcoholicum*, U. S.), when well prepared, forms an excellent substitute for the *aconitia*. The common extract of the Pharmacopœia (*Extractum Aconiti*, U. S.)—an inspissated juice—is not so good.

Uses.—Internally in chronic rheumatism, gout, cancer, &c.; but it is more valuable as an external application, particularly in neuralgia, when applied in the form of tincture.

Dose, of the *purest aconitia*, $\frac{1}{50}$ th of a grain (Pereira); but is very

seldom used; of the *tincture of the root* (*Tinct. Aconiti Radicis*, U. S.)—a saturated tincture—5 drops three times a day; of the *tincture of the leaves* (*Tinct. Aconiti Foliorum*, U. S.), gtt. xx-xxx; of the *alcoholic extract*, $\frac{1}{4}$ th of a grain. The ointment is made by adding the aconitia to fresh lard; it is used in neuralgia.

HEMLOCK. (*Conium*, U. S.)—Leaves and seeds of the *Conium maculatum*, a biennial umbelliferous plant, a native of Europe, but naturalized in the U. S. It has a spindle-shaped root, and a smooth branching stem marked with purple-coloured spots. The leaves are compound, tripennate and bipennate. Believed to be the same plant as the *καμειλον* of the Greeks, and the *cicuta* of the Romans.

The leaves should be collected from plants growing in sunny situations, and preserved in close vessels. When well preserved they retain their green colour and narcotic odour.

Taste bitter and nauseous. Imparts its virtues to alcohol and ether. The *seeds* are small, and have a slight odour and taste, but retain all the active properties of the plant. The active principle is an alkali named *concia*, of a highly acrid nature, sparingly soluble in water, forming salts with the acids.

Effects on System.—Said by Christison, who has experimented upon it, to act as a direct sedative to the cerebro-spinal system, occasioning paralysis of the voluntary muscles, and subsequently of the muscles of respiration, together with vertigo and general debility. Its influence appears to be exerted more over the nerves of motion than over those of sensibility, producing a paralyzing effect upon the muscles supplied by the former.

Uses.—Employed by the ancients as a discutient or resolvent, in enlargements and indurations of the glands and viscera; also in

Fig. 13.



serofula, bronchocele, leprosy, syphilis, and ulcers of a cancerous character. Its chief reputation has been in cancer, for which it was introduced into practice by Störk of Vienna; but it is highly probable that its alleged virtues in this disease are solely due to its narcotic powers.

Hemlock is used in *powder*—dose, 3 or 4 grains two or three times a day; *tincture*—dose, fʒss to fʒj; *extract*—an inspissated juice of the leaves,—3 grs. two or three times a day.

HYDROCYANIC ACID. (*Acidum Hydrocyanicum*, U. S.)—This acid is a compound of hydrogen and cyanogen, and is of vegetable origin, being found in the bitter almond, cherry laurel, and in most of the species of the *prunus* and *amygdaleæ*. Usually obtained, however, by decomposing the bichloride of mercury, by hydrochloric, or hydrosulphuric acid. The concentrated, or purest acid, is a limpid fluid of a sp. gr. of 0.697; having a strong peculiar odour, which, however, differs from that of the oil of bitter almonds; extremely volatile; boils at 79°; has a great tendency to undergo decomposition, and is extremely poisonous. It is never employed in the undiluted form.

The *medicinal* or *dilute* hydrocyanic acid is procured by the reaction of hydrochloric acid on cyanide of silver in water. Its properties are similar to those of the concentrated acid, only in a less degree; it contains from 2 to 3 parts of real acid in 100 of water. It is very liable to decomposition, especially when exposed to the light; hence it should be kept in a dark place.

Effects on System.—In very small doses, repeated, it causes a bitterish taste, nausea, vertigo, faintness, but no very certain alteration of the circulation. The more violent effects are great and sudden prostration, giddiness, and faintness, tetanic convulsions, and insensibility, difficult and spasmodic respiration, and death. The peculiar odour of the acid is usually very distinct. The post-mortem appearances are not very definite. The best *antidotes* are chlorine, ammonia, the cold affusion, and artificial respiration.

Uses.—Internally, as a remedy in certain nervous affections, particularly *gastrodynia*; also in whooping-cough, asthma, epilepsy, hypertrophy and palpitation of the heart, and in the cough of phthisis. Externally, it is employed as a wash in certain forms of skin disease,—the proportions being ʒij of the dilute acid to Oss distilled water. Dose of the official acid, 1 to 3 drops, repeated till some obvious effect is produced.

As a substitute for hydrocyanic acid, the *cyanide of potassium* may be used, since it is not, like the former, apt to undergo decomposition when kept. It may be given in the dose of $\frac{1}{4}$ gr., gradually increased. When swallowed it becomes converted into hydrocyanic acid, by the acid of the stomach. Another good substitute is the *oil of bitter almonds*—in the dose of $\frac{1}{4}$ of a drop, to be repeated.

CLASS IX.

ALTERATIVES.

ALTERATIVES are medicines which, by slowly and gradually modifying the nutrition of an organ or tissue, subvert diseased action, and bring about a healthy condition.

No especial evidence of their action upon the system is afforded, except the gradual disappearance of disease, and the restoration to health.

It is highly probable that most, if not all the true alteratives act by entering into combination with the proteine principles, either of the blood, or of the tissues, forming compounds incompatible with the continuance of the morbid nutrition of the part. Now, by continuing their use for some time, the nutrition becomes completely modified; and, on discontinuing them, the tissue gradually returns to a healthy nutrition; the compounds, which had in the mean time been formed, being removed by absorption.

It can easily be understood, then, how such remedies, if pushed too far, will prove injurious by breaking down the crasis of the blood, and inducing a cachectic condition.

Some of them appear to possess the power of especially attacking morbid deposits of a proteine nature, as indurations, or thickenings from a deposit of coagulable lymph, &c.; such an action is sometimes called *liquefacient*.

MERCURY. (*Hydrargyrum*, U. S.)—In the *metallic state*, it is not believed to act upon the system; but, when swallowed in that state, it very soon is oxidized, and then becomes efficient. The *vapour* from metallic mercury is known to be active, as is seen from its effects on artisans who work in that metal. The effects of mercury on the system may conveniently be considered under the two heads of its *alterative* and its *salivant* operation. When given in very minute doses, and continued for a length of time, it augments all the secretions, causing increased action of the mucous membranes generally; at the same time, the absorbents are stimulated to greater activity, so that under its operation, effused fluids are seen to diminish or disappear, and glandular enlargements are often dispersed. It also usually relaxes the bowels, in consequence of the augmented secretion of their mucous membrane.

In larger doses, mercury acts as a *sialogogue*, producing all the above-mentioned effects, only to a greater degree, and in addition, increased action of the salivary glands, with swelling and soreness of the gums—a train of symptoms denominated *salivation*. The signs of the mercurial sore mouth are the following: slight swelling

and tenderness of the gums, particularly when the teeth are pressed together; a coppery taste in the mouth; a peculiar, unpleasant breath, and an increased flow of saliva, which may become excessive. During this state, the fat is rapidly absorbed, the patient becoming emaciated; the nervous and circulatory systems are excited, and the blood, when drawn, exhibits the same appearance as in inflammation.

On some constitutions, mercury produces a sort of poisonous effect, causing great prostration, a small and frequent pulse, with a pallid and contracted countenance. It sometimes occasions an eruption upon the skin of a miliary character, and in some instances, gives rise to profuse sweats. The remedy for these effects is pure fresh air, and a tonic course of treatment.

Mercury produces its influence upon the system, in consequence of being absorbed, as is proved by the fact of its being detected in several of the secretions, as well as in the solids.

Uses.—1. *As an alterative.*—In *functional disorder of the digestive organs*, as indicated chiefly by the appearance of the stools, which are either scanty, dry, and of a clay colour, showing a deficiency of bile, or very copious, liquid, and of a bilious colour, showing a redundancy of bile;—in *constipation*, which very often depends on a deficient hepatic secretion, or deficient secretion of the intestinal mucous membrane;—in *some forms of chronic cutaneous disease.*—*Dose*,—as an alterative, half a grain to a grain of calomel, or three grains of blue mass, every night, or every other night, to be followed next morning with a laxative, if the bowels are confined. In acute cases, much smaller doses may be given, and more frequently repeated.

2. *As a sialogogue.*—In *fevers*, mercury is very useful; chiefly in exciting the secretions. The proper indications for its use are a dry tongue, torpor of the bowels, dry skin, and scanty urine; it is an important remedy in typhoid fever; but here the *mildest* salivation is only required. In very high grades of fever, it is almost impossible to salivate.—In *inflammation*, it is a valuable therapeutic agent, acting as a true antiphlogistic or anti-plastic, preventing the formation of coagulable lymph, more particularly where the serous membranes are involved; generally, bloodletting should be premised: it is contra-indicated in inflammations of an erythematous, gangrenous, malignant, or serofulous character.—In *diseases dependent on disordered secretion of the liver*, as dysentery, diarrhoea, ascites, &c.—*To promote absorption*, as in the various forms of dropsies.—To produce what has been termed its *revolutionizing effect*, in certain specific diseases, especially syphilis, but only in its secondary form; also, in colica pictonum, in which it may be usefully combined with opium.

It is contra-indicated in serofula, phthisis, all malignant diseases, and suppurations. *Dose*, as a salivant, half a grain to a grain

of calomel, or 3 to 5 grs. blue pill, three times a day: opium to be added, if it purge. If the stomach be irritable, the mercurial ointment may be rubbed on the insides of the arms and thighs, or applied to blistered surfaces; or fumigations with cinnabar may be resorted to.

There is a great difference in the susceptibility of different persons to the salivant action of mercury; it is much more difficult to salivate children than adults. Sometimes the medicine accumulates in the system, and breaks out with great violence.

In producing salivation, the mildest impression is all that is required; excessive salivation is always to be avoided. The treatment for it is to reduce the local inflammation by leeches and blisters, if necessary; astringent and detergent washes of alum, sugar of lead, &c., and opium internally.

PREPARATIONS OF MERCURY.—It is not, at present, given in the liquid form. When given in the metallic state, it is *extinguished*, by being first rubbed up with different substances, which serve to divide it very minutely, and perhaps, partially to oxidize it.

Mercurial or Blue Pills. (*Pilulæ Hydrargyri*, U. S.)—Made by rubbing up metallic mercury with conserve of roses and liquorice-root;—requires a long trituration. Colour, bluish; becomes darker by exposure; weight of the officinal pill, three grains. Dose, as a sialogogue, one pill, three times a day; as an alterative, one pill, every other night;—sometimes given in emulsion.

Mercury with chalk. (*Hydrargyrum cum Cretâ*, U. S.)—Prepared by triturating mercury with prepared chalk; colour, bluish-gray; a mild mercurial, particularly useful in the bowel-affections of children. Dose, from 1 to 10 grs., three or four times a day.

Mercurial Ointment. (*Unguentum Hydrargyri*, U. S.)—Sometimes called *blue ointment*; prepared by rubbing up together mercury, lard, and suet, until the mercury is extinguished; colour, bluish; becomes darker by age; used to produce the mercurial impression, by rubbing into the skin; also to blistered surfaces.

Mercurial Plaster. (*Emplastrum Hydrargyri*, U. S.)—Made by rubbing up mercury with melted rosin and oil, and then mixing with melted lead-plaster; used to discuss glandular swellings, &c.

Mild Chloride of Mercury. (*Hydrargyri Chloridum Mite*, U. S.)—Chemically, a *protochloride*; common name, *Calomel*. Made by subliming a mixture of the protosulphate of mercury and chloride of sodium; double decomposition ensues, resulting in the formation of protochloride of mercury and sulphate of soda; crystalline at first; requires to be powdered and washed in water; colour, ivory-white; no taste or smell; insoluble in water or alcohol; incompatibles, alkalies, alkaline earths, and sulphurets. Dose, as a sialogogue,

gr. ss to gr. j, three times a day; as an alterative, gr. j, every night, or every other night. *Howard's calomel* is a very fine variety, made by allowing the vapour to come in contact with watery vapour.

Corrosive Chloride of Mercury. (*Hydrargyri Chloridum Corrosivum*, U. S.)—Common name, *Corrosive Sublimate*; chemically, a *bichloride*; made, by subliming a mixture of the bisulphate of mercury and chloride of sodium. At first, it is in white, semi-transparent masses; soluble in water and alcohol; taste, metallic and styptic; very poisonous; best antidote is albumen; not much used internally; not so liable to salivate as calomel; externally applied, it is escharotic; a weak solution, or ointment, is employed in venereal sore throat, and cutaneous diseases.

Black Oxide of Mercury. (*Hydrargyri Oxidum Nigrum*, U. S.)—Chemically, a *protoxide*; made by adding calomel to lime-water, or a solution of potash; colour, black; used chiefly as a wash for chancre, in the form of *black wash*. Dose, $\frac{1}{4}$ gr.

Red Oxide of Mercury. (*Hydrargyri Oxidum Rubrum*, U. S.)—Chemically, a *binoxide*; common name, *red precipitate*; made by heating the nitrate; occurs in small, shining, red crystals; never used internally; but externally, as a stimulant for old and indolent ulcers; also, for psorophthalmia, in the form of ointment.

Iodide of Mercury. (*Hydrargyri Iodidum*, U. S.)—Chemically, a *protiodide*; made by rubbing up mercury and iodine together with alcohol; colour, greenish-yellow; used in secondary syphilis; dose, one grain, gradually increased.

Biniiodide of Mercury. (*Hydrargyri Iodidum Rubrum*, U. S.)—Prepared by action of corrosive sublimate on iodide of potassium; colour, brilliant red; used as an ointment in skin diseases.

Red Sulphuret of Mercury. (*Hydrargyri Sulphuretum Rubrum*, U. S.)—Common name, *Cinnabar*; found native; made by heating together mercury and sulphur; colour, fine red; powder is called *vermilion*,—used for fumigation.

Black Sulphuret of Mercury. (*Hydrargyri Sulphuretum Nigrum*, U. S.)—Old name, *Ethiop's mineral*; prepared by rubbing sulphur and mercury together in a mortar; colour, black; scarcely ever used at present.

Yellow Sulphate of Mercury. (*Hydrargyri Sulphas Flavus*, U. S.)—Common name, *Turpeth mineral*; made by the action of boiling water on the bisulphate; the yellow subsulphate precipitates; very little used; emetic, in the dose of 5 grains.

Nitrate of Mercury. (*Hydrargyri Nitratis*, U. S.)—Used only in the form of ointment,—called *citrine ointment* (*Unguent. Hydr. Nitratis*, U. S.), made by heating the fresh nitrate with lard and neat's-foot oil. This is of a fine citron colour, when first made, but spoils by being kept; much used in skin diseases, and as a stimulant to ulcers.

Ammoniated Mercury. (*Hydrargyrum Ammoniatum*, U. S.)—Common name, *white precipitate*; made by adding the solution of ammonia to a solution of corrosive sublimate; occurs in white masses, without odour; used only as an ointment for cutaneous diseases.

IODINE. (*Iodinium*, U. S.)—A simple, non-metallic solid, of a bluish-gray colour, and metallic lustre, with a peculiar odour; volatile; sparingly soluble in water; more so in alcohol.

Effects on System.—In very small doses, it acts as a general tonic, occasionally increasing the flow of urine, and sometimes producing salivation. If continued for a length of time, it stimulates the absorbents, causing emaciation. If still longer employed, it acts upon the nervous system and digestive organs. In large doses, it is a corrosive poison. Used chiefly to promote the absorption of indurations and enlargements, &c. Probably, the best remedy in goitre, in which it may be employed both internally and externally. Scrofula is another disease in which iodine acts beneficially, particularly in the form of glandular swellings, ophthalmia, abscesses, &c.; also in chronic rheumatism, chronic cutaneous diseases, and tertiary syphilis. Dose, $\frac{1}{4}$ to $\frac{1}{2}$ a grain, but not in substance, on account of its difficult solubility.

Tinctura Iodinii, U. S.—Contains \mathfrak{zj} of iodine to \mathcal{Oj} alcohol; not quite saturated; when long kept, it is partially decomposed; dose, 10 to 20 drops, in sweetened water. The tincture used advantageously, externally, in lupus, erysipelas, and other skin diseases; and also in affections of the joints; to be applied by means of a small brush.

Compound Tincture of Iodine, (*Tinct. Iodinii Composita*, U. S.), contains \mathfrak{zss} of iodine, \mathfrak{zj} of iodide of potassium, and \mathcal{Oj} of alcohol.

Iodide of Potassium. (*Potassii Iodidum*, U. S.)—Made by mixing together iron filings and iodine with water, by which iodide of iron is formed; then decomposing with carbonate of potassa. It is in the form of white cubical crystals; somewhat deliquescent; very soluble in water and alcohol; taste, acrid and saline; its aqueous solution has the property of dissolving iodine. It acts on the system very much as iodine, though less energetically;—used in cachectic conditions, particularly in tertiary syphilis; in the various forms of scrofula, rheumatism, &c. Dose, 3 to 20 grs., three times a day. Sometimes it produces some irritation of the bowels, and vertigo.

Lugol's Solution of Iodine. (*Liquor Iodinii Compositus*, U. S.)—Made by dissolving \mathfrak{zjss} iodide of potassium and \mathfrak{zvj} iodine, in \mathcal{Oj} water; dose, 6 to 30 drops, three times a day, gradually increased. This is an active and excellent preparation, much used by Lugol in the treatment of scrofula.

There are many other preparations of iodine, more or less employed; as the *iodide of lead*; *iodide of sulphur*,—used in the form of an ointment, in certain cutaneous affections;—*iodide of zinc*, &c.

Iodine Ointment. (*Unguentum Iodini*, U. S.)—Made by rubbing up together iodine and lard.

Unguentum Iodini Compositum, U. S.—Made like the other, with the addition of some iodide of potassium; both are used in indolent serofulous tumours.—Iodine and iodide of potassium are sometimes employed in the form of bath.

ARSENIC. (*Arsenicum*, U. S.)—Probably inert, so long as it retains its metallie state; but very active, as an oxide, or salt.

Effects.—In very minute doses, it is tonic and alterative; but, if persisted in, it causes muscular debility and general depression of the system. It acts by being absorbed into the blood, as is proved by its existence in the secretions. In large doses, it is a powerful corrosive poison. Symptoms of poisoning—pain and heat of stomach, pain of throat, vomiting of acrid matters, incessant thirst, prostration, and death. Antidote—the *hydrated peroxide of iron*, which acts chemically, forming an insoluble arsenite of iron.—Used chiefly in intermittent diseases; will often cure intermittent fever, when quinine fails; also, in chronic skin diseases, particularly of a sealy character; also in nodes. Dose of arsenious acid, $\frac{1}{12}$ th of a grain, three times a day, in pill.

Fowler's Solution. (*Liquor Potassæ Arsenitis*, U. S.)—Made by boiling together 64 grs. arsenious acid and carbonate of potassa, each, in f℥xij water, and then adding f℥ss spirits of lavender, to impart a colour. Dose, 10 drops; but often this will be found too much for some constitutions.

The arsenical preparations should be given on a full stomach, and their effects very carefully watched. One of the first symptoms of the system being brought under their influence, is an œdema of the eyelids, which will subsequently spread over the face.

LOCAL REMEDIES.

CLASS X.

EMETICS.

MEDICINES which, as an ordinary result, produce vomiting. The effect of an emetic is not immediate; usually from 10 to 20 minutes

elapse before vomiting occurs. Emesis is partly the act of the stomach, and partly of the brain and spinal marrow; if the brain be stupified by narcotics, the stomach becomes very insusceptible to the action of emetics. Some emetics act only if *immediately* applied to the stomach; others produce their effect no matter how introduced into the system. The act of vomiting is chiefly *reflex*. If the eighth pair of nerves be cut, no vomiting is produced by emetics. The susceptibility to their influence is increased by irritation or inflammation of the stomach, and by fever; it is lessened by nervous disorders, and by narcotic poisons.

Emetics are useful to remove improper matters from the stomach, as poisons or ingesta; to deplete from the system; to promote the secretions; to produce muscular relaxation; to give a shock to the system, and thus break up morbid associations; to cause pressure on the surrounding viscera; to reduce arterial action; and to cause revulsion to the stomach. They should be avoided, if possible, in congestion of the brain, hernia, the advanced stages of pregnancy, and in inflammation of the stomach and surrounding parts.

IPECACUANHA, U.S.—Root of the *Cephaelis ipecacuanha*, a perennial plant, growing in Brazil; about 5 or 6 inches high. The roots, as met with in the shops, are several inches long, contorted,

Fig. 14.



of a grayish-brown colour, about the thickness of a small quill, apparently composed of a series of transverse rings, from which cause it is often called *annulated*. The cortical portion, which includes

the rings, is hard, horny, and brittle, resinous in its fracture; the ligneous portion is small and inert. There are three varieties, *brown*, *red*, and *gray*. Colour of powder, light fawn; odour, slight in mass. The powder excites sneezing, and, in some, asthmatic symptoms. Water and alcohol extract its virtues; but injured by long boiling; also by exposure to the light. Active principle, an alkali called *emetia*.

Uses.—In very small doses it is tonic and alterative; rather larger doses prove diaphoretic and expectorant; still larger quantities cause vomiting. Its emetic operation is mild, prompt, and certain; hence it is very useful as an evacuant from the stomach. It has been used with advantage in hemorrhage.—Dose, as an alterative, $\frac{1}{4}$ to $\frac{1}{2}$ gr.; as a diaphoretic, $\frac{1}{2}$ to grs. ij; as an emetic, 15 to 30 grs.; best given in warm water.

The *Vinum Ipecacuanhæ*, U. S., contains \mathfrak{zj} to \mathcal{Oj} ;—dose, as an emetic, $\mathfrak{f}\mathfrak{zj}$,—for an adult. Used chiefly as a diaphoretic and expectorant.

The *Syrupus Ipecacuanhæ*, U. S., is of about the same strength.

There are several indigenous emetics, the most important of which are the following:

GILLENIA, U. S.—Root of the *G. trifoliata* and *G. stipulacea*. It is sometimes called *Indian physic*. It has a long, branching root, of a reddish-brown colour. Dose of powder, 20 to 30 grs. A good substitute for ipecacuanha.

EUPHORBIA IPECACUANHA, U. S. (*American Ipecacuanha*), and E. COROLLATA, U. S. (*Large Flowering Spurge*), are very irritant and powerful emetics, especially in the fresh state. They are not much employed on account of the uncertainty of their operation. Dose, gr. x—xxx.

LOBELIA, U. S. (*Indian Tobacco*).—Herbaceous part of the *L. inflata*, an annual plant. Along with its emetic properties it is also narcotic, producing very much the effects of tobacco. Used chiefly in spasmodic asthma. Dose, 5 to 20 grs. The *tincture* is officinal;—dose, $\mathfrak{f}\mathfrak{zj}$; repeated if requisite.

SANGUINARIA, U. S.—Root of the *S. Canadensis*, or *blood-root*; distinguished by its red colour, and truncated appearance. Emetic, and slightly narcotic; also used in catarrhs. Dose, 10 to 20 grs.;—of tincture, $\mathfrak{f}\mathfrak{zj}$ to $\mathfrak{f}\mathfrak{zss}$.

Squill and *Tobacco* are emetic in large doses, but are seldom employed for this purpose; the great prostration produced by the latter is an objection.

Mustard, in powder, is a stimulant emetic; it may be used in some cases of narcotic poisoning.

MINERAL EMETICS.

TARTAR EMETIC differs in its action, as an emetic, from ipecacuanha, in causing much more retching, nausea, and general disturbance of the system; hence employed to act upon the surrounding viscera, as in congested liver or spleen; to break up the paroxysms of intermittents; to produce relaxation in croup, and in dislocations; in nervous diseases, as in neuralgia and amaurosis. Ipecacuanha is preferable in poisoning from narcotics. Often combined with ipecacuanha. Dose, 2 or 3 grs.; best given in divided quantities, dissolved in water. Dose of *Vinum Antimonii* as an emetic, fʒj, repeated, for an adult.

SULPHATE OF ZINC.—A very prompt and powerful emetic, causing but little nausea. Chiefly used in cases of narcotic poisons,—best to combine it with ipecacuanha. Dose (medium), gr. x; in narcotic poisoning, ʒj.

SULPHATE OF COPPER.—A still more powerful emetic than the last;—used also in narcotic poisoning;—sometimes in membranous croup. Medium dose, 2 or 3 grs.; in cases of poisoning by narcotics, 5 to 15 grs.;—danger of inflammation from over-doses.

The *Turpeth Mineral*, *Arsenic*, and *Corrosive Sublimate*, are each emetic in large doses, but are scarcely ever used with this intention. *Alum* is occasionally employed.

CLASS XI.

CATHARTICS.

THESE are medicines which evacuate the alimentary canal. They act either, 1, by increasing the peristaltic movement, or, 2, by augmenting the mucous secretions, or, 3, by stimulating the liver to throw out bile. Such cathartics as merely evacuate the intestinal contents, are termed *Laxatives*; those which produce increased secretion into the bowels, *Purgatives*; and such as cause large watery discharges, *Hydragogues*. Cathartics also differ as to the part of the canal which they affect; thus aloes chiefly acts upon the rectum; gamboge and calomel upon the upper bowels; the neutral salts upon the whole tract. Some occasion a great amount of depletion, while others, as rhubarb, produce a tonic impression. The term *drastic* is applied to such as act with great violence.

Uses.—To evacuate the bowels from noxious matters; to relieve constipation and its attendant evils; to deplete from the system; to promote absorption, in dropsies; to cause revulsion to the bowels, particularly in cerebral disorders. They are contra-indicated in inflammation of the mucous membrane of the bowels; and should be cautiously employed in typhoid fever. Their activity is increased by the addition of small quantities of emetics and bitters. Their griping effect is best obviated by combination with aromatics or opium. They act most powerfully when taken in an empty stomach. Hypercatharsis is best checked by an anodyne enema.

There are several *articles of diet* which are laxative, and may be usefully employed in medicine, such as the ripe fruits in their fresh state, or the same dried and stewed,—particularly peaches, prunes, and tamarinds. Sugar is also laxative, particularly in the form of *West India molasses*. *Rye or oatmeal mush and molasses* form an excellent article of diet in habitual costiveness, and in hemorrhoids. Sugar is apt to disagree with the stomach of dyspeptics, on account of its liability to generate an acid. *Bran* is an excellent article of diet in dyspepsia and constipation; believed to produce its laxative impression by mechanical irritation; best used in the form of *bran-bread*, made from the unbolted flour

PURGING CASSIA. (*Cassia Fistula*, U. S.)—Fruit of the *C. fistula*, a tree growing in the East and West Indies; consists of pods about a foot in length, containing numerous seeds surrounded with a black, sweetish pulp. The *pulp* is procured by bruising the pods, and boiling in water. It is a mild laxative, and forms one of the ingredients in the Confection of Senna. Dose \mathfrak{zj} to \mathfrak{zj} .

MANNA, U. S.—Concrete juice of the *Ornus Europæa*, a tree growing in the countries bordering the Levant. Procured both by spontaneous exudation and incisions. Three varieties found in commerce. 1. *Flake Manna*, the result of spontaneous exudation; comes in pieces two or three inches long, about an inch wide, bearing the marks of the bark, &c., on which it has concreted; colour, yellowish-white; odour, faint; taste, sweetish. 2. *Common Manna*, or *Manna in sorts*, procured, when the season is more advanced, by incisions; consists of particles of the flake, mixed with a fluid portion and impurities; colour, darker; inferior. 3. *Fat Manna*, obtained still later in the season; consists chiefly of the fluid portion, with numerous impurities; colour, much darker. Manna consists of common sugar, united to a peculiar saccharine principle, called *mannite*.

Uses.—A mild laxative, adapted to cases of constipation, hemorrhoids, and pregnancy; also to children. Dose \mathfrak{zss} to \mathfrak{zj} .

CASTOR OIL. (*Oleum Ricini*, U. S.)—Product of the *Ricinus communis*, or Palma Christi (Fig. 15), growing in various parts of

the world. As found in the United States, it is an annual. The fruit is a three-celled capsule, each cell containing an oblong, spotted, brownish seed. The seeds are powerfully purgative, in consequence of an aerid principle which they contain, and which is dissipated by a high heat. The oil is procured either by expression or decoction. 1. *Expression*. The seeds are gently heated, and then subjected to powerful pressure; a thick, whitish oil exudes, which is boiled for some time in a large quantity of water; this dissolves out the mucilage, and coagulates the albumen; the clean oil is now

Fig. 15.



removed, and boiled with a minute quantity of water, to drive off the aerid principle. 2. *Decoction*. The seeds are bruised and boiled in water; the oil rises and is skimmed off the surface, and is again boiled to remove the aerid principle; apt to have a

darker colour than the other. The acrid principle is thought to consist of two acids, named *ricin-oleic*, and *ricin-stearic* acids.

Uses.—A mild and certain cathartic, intermediate in its action between laxatives and purgatives. The more it is free from colour, smell, and taste, the better; soluble in cold alcohol; particularly applicable to cases of children and pregnant women; also in irritated and inflamed bowels, colic, dysentery, and diarrhœa. Ordinary dose f ʒj, though less will frequently operate. Infants require a larger proportionate dose than adults, in consequence of their digesting it. May be given in boiling milk, hot coffee, &c.; but best in the froth of porter or ale; also as an emulsion.

Linseed oil and *melted butter* may be substituted for castor oil.

RHUBARB. (*Rheum*, U. S.)—Root of different species of *Rheum*, as *R. palmatum* (Fig. 16), *R. undulatum* (Fig. 17), *R. compactum* (Fig. 18), &c., growing in Tartary and other parts of Asia; also cultivated in Europe. It is a perennial plant, with large branching roots and numerous large petiolate leaves.

The roots, when dug up, are carefully dried, sorted, and sent to market. Three varieties are recognised: 1. *Russian* or *Turkey Rhubarb*. This kind is prepared with extreme care, at a frontier town between Tartary and Russia, each piece being bored down to its centre to ascertain its soundness: imported from St. Petersburg. The pieces are irregularly cylindrical in shape, with angular edges, of a lively yellow colour externally, variegated within; yields before the knife, feels gritty to the teeth, stains the saliva, and has a bitter and astringent taste; it is the most valuable. 2. *Chinese Rhubarb*. Probably of similar origin with the other; shipped from Canton; the pieces are smooth and powdery on the outside, appearing as if rasped. Colour, not so lively; odour and taste, similar to the other; the perforation extends quite through, and sometimes presents the remains of the string upon which it was dried; inferior in value, but much cheaper. 3. *European Rhubarb*.—Comes in long thin pieces, more compact; does not tinge the saliva, nor feel gritty to the teeth; inferior to the others as a purgative.

Active principle, *rhubarberin*,—a yellow, crystalline, volatile substance; contains also tannin, oxalate of lime, rheic acid, an odorous principle, colouring matter, &c. Water and alcohol extract its virtues; it should not be long boiled.

Uses.—A good tonic cathartic, operating chiefly on the peristaltic motion; does not deplete, and hence the best purgative in typhoid cases. Much used in constipation, combined with aloes and soap. It sometimes gripes, in which case it may be combined with aromatics. Dose, as a laxative, 5 to 10 grains; as a purgative, 20 to 30 grains; given in powder or pill. The following are the official preparations; *Infusum Rhei*, made in the proportion of ʒij to Oj water; *Tinctura Rhei*, useful in typhoid complaints; *Tinct. Rhei*

et Aloes, formerly called *Elixir Sacrum*; *Tinct. Rhei et Gentianæ*; *Tinct. Rhei et Sennæ*, or *Warner's Gout Cordial*; *Syrupus Rhei*;

Fig. 16.



Fig. 17.



Fig. 18.



Syrupus Rhei Aromaticus, or *Spiced Syrup of Rhubarb*; *Syrupus Rhei et Sennæ*; *Vinum Rhei*; *Extractum Rhei*; *Extractum Rhei Fluidum*; *Pilulæ Rhei*; *Pil. Rhei. Compositæ*.—Roasting impairs the purgative property of rhubarb, but does not affect its astringency.

ALOES. (*Aloe*, U. S.)—Inspissated juice of the leaves of different species of *Aloe*, as *A. spicata*, *A. Socotrina*, and *A. vulgaris*,—succulent plants with long, narrow, toothed leaves, growing in tropical countries. The juice is procured either by draining from the leaves, by expression, or by boiling. Several varieties recognised in commerce: 1. *Cape Aloes*. Obtained from the *A. spicata*, growing at

the Cape of Good Hope; occurs in masses of a shining, dark olive-green colour, of a vitreous fracture, translucent at the edges; powder, of a greenish-yellow colour; odour, disagreeable; taste, intensely and permanently bitter. 2. *Socotrine aloes*,—from the *A. Socotrina*; pieces of a yellowish-brown colour, less shining than the former; fracture conchoidal; odour, aromatic; taste, very bitter; much the most valuable variety. 3. *Barbadoes aloes*,—prepared in the West Indies; the product chiefly of the *A. vulgaris*; colour dark-brown, not shining; odour disagreeable; much used for horses. 4. *Hepatic aloes*,—known in India as *Bombay aloes*; probably an inferior variety of Socotrine and other sorts; it has a dark liver colour.

Aloes consists of a peculiar soluble matter, termed *aloësin*, and an insoluble substance called *apotheme*. It yields its virtues to water and alcohol.

Uses.—A warm purgative, slow in its operation, acting on the lower bowels; will sometimes produce piles, if too long continued; it also has a tendency to the pelvie viscera generally; chiefly given in constipation, combined with soap, rhubarb, or colocynth. Dose, as a laxative, 2 to 6 grs.; as a purgative, 10 to 15 grs. The official preparations are the following: *Pilulæ aloës et assafœtidæ*, very useful in the constipation of old people; *Pilulæ aloës et myrrhæ*, or *Rufus' Pills*; *Pil. Rhei compositæ*; *Pulvis aloës et canellæ* or *hierapicra*; *Tinctura aloës*; *Tinc. Aloes et myrrhæ*, or *elixir propricitatis*; *Vinum aloes*.

SENNA, U. S.—Leaflets of different species of *Cassia*, as the *C. acutifolia* (Fig. 19), *C. obovata*, *C. elongata*, *C. Æthiopica*, small shrubs growing in tropical Asia and Africa. Several commercial varieties: 1. *India senna*, the product of the *C. elongata*, grown in Arabia and Africa, and thence taken to India; leaflets long and narrow, intermingled with pieces of pods. 2. *Tinnivelly senna*; probably from the same source as the preceding, but much longer and more distinct; very free from impurities, and highly esteemed. 3. *Alexandria senna*, product of the *A. obovata* and *A. acutifolia*, derived from Upper Egypt; it contains also the leaves of the *Argol*. 4. *Tripoli senna*, from the *A. Æthiopica*,—seldom now found in market.

The true senna leaves may be recognised by their oblique lower edges, and the inequality of their insertion into the footstalk; odour, faint, but peculiar; taste, sweetish and nauseous; active principle, *cathartin*.

Senna is an active hydragogue cathartic; generally administered in combination with manna, or the neutral salts. *Infusion* (*Infusum Sennæ*, U. S.) made in the proportion of 3j to Oj. Its griping tendency obviated by combining with aromatics, or the neutral salts.—The

following preparations are officinal: *Tinctura Sennæ et Jalapæ*, or *Elixir salutis*; *Confectio Sennæ*, or *Lenitive electuary*; *Syrupus Sennæ*; and *Fluid extract of senna*.

Fig. 19.



The leaflets of the *American Senna* (*Cassia Marilandica*, U. S.), an indigenous plant, possess similar properties to those of the true senna, and may be advantageously used as a purgative, in a rather larger dose.

SCAMMONY. (*Scammonium*, U. S.)—Dried juice from the root of the *Convolvulus scammonia*, a climbing plant, growing in Syria and Asia Minor. It is obtained by slicing off the root, and allowing the juice to conerete. Formerly, the commercial varieties were distinguished as *Aleppo*, *Smyrna*, and *Montpellier* scammony; at present, they are generally known under the two heads of *genuine* and *factitious*. The purest kind (seldom seen here), is denominated *virgin* or *tear scammony*; it consists of shapeless masses, rather porous, of a dull ash colour, and free from impurities. The sort usually met with is in saucer-shaped pieces, three or four inches in diameter, of a dark ash-gray colour, hard, and containing numerous adulterations. It is often common to designate the genuine drug, from whatever source procured, as *Aleppo scammony*; while the term *Smyrna scammony*, is applied to the others. The *spurious* or *factitious* scammony, is chiefly manufactured in the south of France. Odour peculiar, resembling old cheese; taste acrid and bitter; chemically, a gum-resin, the *resin* being the active portion.

Effects.—A drastic cathartic; over-doses cause irritation and inflammation of the bowels; seldom given alone. Dose, five to ten grs.;—an ingredient in the *Compound extract of colocynth*.

Fig. 20.



JALAP. (*Jalapa*, U. S.)—Tuber of the *Ipomoea Jalapa* (Fig. 20), a climbing Mexican plant. The tubers are imported either whole or sliced. They vary from the size of a walnut to that of an orange; externally, of a blackish-gray colour, heavy, hard, and of a brownish fracture; odour peculiar and nauseous; taste nauseous; colour of powder, light brown. The root is apt to be adulterated. Virtues imparted partly to water, and partly to alcohol. Active ingredient is a resin; it contains also much starch, and some gum and sugar.

Effects.—A powerful hydragogue cathartic; much used in dropsies and chronic affections of the joints, particularly in combination with cream of tartar. Dose, 15 to 30 grs.; dose

of calomel and jalap, 10 grs. of each,—used in bilious complaints; dose of jalap and erem. tartar, 10 to 20 grs. of the former, and 2 to 4 drachms of the latter.

The *Resin of Jalap* is the alcoholic extract: dose, 8 to 10 grs. *Extract of Jalap* is used in doses of 10 to 20 grs.; the *tincture* is also officinal. The *Pulvis Jalapæ Compositus*, U. S., is a mixture of one part of jalap and two parts of cream of tartar.

The **MAY APPLE** (*Podophyllum peltatum*, U. S.), an indigenous perennial plant, possesses very similar medical properties to those of jalap. The root, which is the part used, is very long and branching, of a brownish colour externally. It contains a peculiar principle—*podophyllin*. It may be employed in the same cases as jalap. Dose, the same. The *extract* is officinal.

COLOCYNTH. (*Colocynthis*, U. S.)—Fruit of the *Citrullus colocynthis*, or *Bitter cucumber*, a vine resembling the common cucumber, growing in the South of Europe, Asia, and Africa. Fruit about the size and shape of an orange; has a yellow rind, and a white, light, and porous pulp, containing numerous seeds. As found in the shops, it is usually divested of the rind. Taste, extremely bitter; virtues to water and alcohol; the infusion gelatinizes on cooling in consequence of the *pectin* contained; active principle, *colocynthin*.

Effects.—A powerful hydragogue, producing in over-doses inflammation of the bowels Not much used alone.—Dose, 5 to 10 grs.

Fig. 21.



The *compound extract* (*Extractum Colocynthis Compositum*, U. S.), is an excellent cathartic; it contains colocynth, aloes, scammony, soap, and cardamoms;—dose, 10 to 15 grs.

BLACK HELLEBORE. (*Helleborus*, U. S.)—Root of the *Helleborus niger*, growing in the southeast part of Europe. Sometimes called the *Christmas rose*. The root, as found in the shops, consists of a knotted caudex, from which proceed numerous black fibres, smooth and brittle; odour, slight; taste, bitter and nauseous; becomes much feebler by being kept; virtues to alcohol and water.

Effects.—A drastic hydragogue, also emmenagogue; much used by the ancients in mania; not so much employed at present. It is sometimes named *Melampodium*. Dose, 10 to 20 grs.;—of the *tincture* (*Tinc. Hellebori*, U. S.) f ʒj; of the *extract* (*Extractum Hellebori*, U. S.) gr. iij–v.

GAMBOGE. (*Gambogia*, U. S.)—Inspissated juice of the *Hebradendron cambogioides*, a native of Ceylon and Siam. The juice is procured by breaking off the leaves and young shoots; at first it is of a yellow colour, but becomes a dark orange by hardening. Usually found in cylindrical pieces, many of which are hollow. Fracture glossy; colour of powder, bright yellow; no odour, and but slight taste; forms with alcohol a golden-coloured tincture, and with water a yellow turbid emulsion.

Effects.—A powerful drastic cathartic; over-doses dangerous. Dose, 3 to 6 grs., usually given in dropsy, combined with cream of tartar; also in tape-worm.

Compound Cathartic Pill. (*Pilulæ Catharticæ Compositæ*, U. S.)

—An admirable compound cathartic, containing calomel, scammony, gamboge, colocynth, aloes, and jalap; dose for an adult, three pills.

CROTON OIL. (*Oleum Tiglii*, U. S.)—Derived from the seeds of the *Croton tiglii*, a small tree growing in the East Indies. The oil is procured by first roasting the seeds and then subjecting them to pressure. As first obtained it is nearly colourless; but as found in the shops, it has a yellowish-red hue; odour, faint and peculiar; taste, acrid and burning; partially soluble in alcohol, which separates it into its constituent portions; of these, the acrid principle, called *crotonic acid*, is soluble, while the true oil, which is a mild fixed oil, is not soluble. Most liable to be adulterated with castor oil; fraud detected by the solubility of the latter in alcohol.

Effects.—One of the most powerful drastic cathartics; over-doses very dangerous; applicable in obstinate constipation, and in coma; advantage from the smallness of the dose. Dose, 1 to 3 drops, best given in form of pill made up with crumb of bread, each containing half a drop. Applied externally, it produces a pustular eruption, and may be used as a revulsive, in diseases of the chest, &c.; it should be mixed with olive oil. Its external irritant effect varies much in different persons.

ELATERIUM, U. S.—Product of the *Momordica elaterium*, or

Fig. 22.



squirting cucumber (Figure 22), a vine growing in the South of Europe. The fruit is about the size of a lime, oval, of a greenish colour, and covered with numerous prickles. When ripe it bursts, projecting its contents. Elaterium is procured by slicing the fruit, and the juice allowed slowly to drain away upon a muslin sieve, when it gradually deposits the medicine. This is in small flattish

pieces, of a grayish-green colour, light and friable; has no odour, but a bitter and nauseous taste; active ingredient, *elaterin*.

Effects.—Probably the most active of all cathartics. Used chiefly in obstinate dropsy. Dose of the purest (Clutterbuck's), $\frac{1}{8}$ gr.; of

the commerciale, $\frac{1}{2}$ gr.; dose of *elaterin*, $\frac{1}{16}$ to $\frac{1}{12}$ gr. Always best to commence with very small doses, from the uncertainty of the preparation.

MINERAL CATHARTICS.

SULPHUR, U. S.—Used in medicine in the form of *flowers of sulphur*, or common sublimed sulphur washed in water (*Sulphur Lotum*, U. S.) Odour and taste slight; insoluble in water; and nearly so in alcohol; soluble in oils.

Effects.—A mild laxative, but slow in its operation, sometimes griping; it has a decided tendency to the skin, and is thought to act on the bronchial mucous membrane. It is used in constipation attended with piles, in combination with cream of tartar; also, in dyspepsia, chronic rheumatism, chronic catarrhs, and cutaneous eruptions. Dose as a laxative, \mathfrak{zj} to \mathfrak{zij} . Externally, an excellent remedy for scabies, in the form of *sulphur ointment*; also, in the form of vapour and bath. The bath is best in the form of the natural sulphur waters.

Sulphur Præcipitatum, U. S., *lac sulphuris*, *milk of sulphur*—made by boiling together sulphur and lime, and then adding muriatic acid, which precipitates the sulphur in the form of a hydrate; colour, nearly white, but darkens by exposure. It has no advantage over the other form.

CALOMEL.—As a cathartic, it is indicated in cases where the liver is deficient in action, or is secreting vitiated bile. It is slow in its operation, requiring six or eight hours. It is apt to produce nausea and griping some time after being taken, which are no doubt owing to the bile poured out. It is believed to act by being absorbed directly into the vena porta, and so finding its way into the liver. Ordinary dose, 5 to 15 grains, but best to combine it with other purgatives, as rhubarb or jalap. There is a great difference in the susceptibility of different persons to its action. It is one of the ingredients in the *Compound Cathartic Pills*.

MAGNESIA.—Sometimes called *calcined magnesia*, and *magnesia usta*. Procured by exposing the carbonate to a red heat. A very light white powder; its degree of levity, however, depends upon its amount of trituration, its density being increased by that process. In this way the magnesia of Henry, Husband, &c., is made; almost insoluble in water.

Effects.—A mild and useful cathartic, particularly when there is acidity in the primæ viæ. Its cathartic operation is somewhat uncertain, depending upon the presence of an acid: it sometimes accumulates in the bowels. It is also used in sick headaches, and in nephritic complaints; also, in bowel-complaints, combined with rhubarb. Dose \mathfrak{zj} ;—best given rubbed up in syrup.

CARBONATE OF MAGNESIA. (*Magnesiae Carbonas*, U. S.)—Prepared by decomposing any soluble salt of magnesia by an alkaline carbonate. Occurs in white cakes, extremely light and porous; insoluble in pure water; somewhat soluble in carbonic acid water.

Effects.—A gentle laxative, but dependent for its operation on the acid found in the stomach and bowels; apt to occasion flatulence from the escape of the carbonic acid. Dose, $\mathfrak{z}\text{j}$ to $\mathfrak{z}\text{ij}$.

SALINE CATHARTICS.

Nearly all are of mineral origin. They closely resemble each other in their operation upon the system, producing watery evacuations, from their influence over the secretory vessels of the mucous membrane. They are likewise refrigerant, and are hence peculiarly adapted to febrile and inflammatory complaints, but are contra-indicated in typhoid disorders.

SOLUTION OF CITRATE OF MAGNESIA. (*Liquor Magnesiae Citratæ*, U. S.)—Made by adding carbonate of magnesia to a solution of citric acid and syrup; to be put into a strong bottle and corked before effervescence has ceased. It is a very agreeable cathartic. Dose, $\text{f}\mathfrak{z}\text{ij}$ – viij .

EPSOM SALTS. (*Magnesiae Sulphas*, U. S.)—Procured from the bittern of sea-water after the crystallization of the chloride of sodium. A better method is by the action of sulphuric acid on magnesite; also from springs. As usually found, the crystals are small and needle-shaped; contain 50 per cent. of water of crystallization; effloresce slowly; very soluble in water; taste bitter and saline; sometimes contains sulphate of soda as an impurity. One of the best saline cathartics, and very extensively employed. Dose for an adult $\mathfrak{z}\text{j}$; best given in carbonic acid water.

GLAUBER'S SALTS. (*Sodæ Sulphas*, U. S.)—Procured as the residuum after making muriatic acid; also from the bittern of sea-water. Occurs in four-sided crystals; efflorescent; contain more than 50 per cent. water of crystallization; more soluble at 90° than 212° ; taste, very nauseous and bitter; not so much used as Epsom salts;—dose about the same.

SULPHATE OF POTASH. (*Potassæ Sulphas*, U. S.)—Formerly called *vitriolated tartar*; the residuum after the manufacture of nitric acid, from sulphuric acid on nitre; contains no water of crystallization; occurs in small, white, and very hard prismatic crystals; not very soluble; not much used as a cathartic, but chiefly in the preparation of Dover's powder. Dose, $\mathfrak{z}\text{ss}$.

TARTRATE OF POTASSA. (*Potassæ Tartras*, U. S.)—Formerly called *soluble tartar*. Prepared by adding cream of tartar to a hot solution of carbonate of potassa. The crystals contain no water of

crystallization; they are deliquescent, have a cooling bitterish taste, and are very soluble in water;—not much used at present. Dose, $\bar{3}$ ss to $\bar{3}$ j.

CREAM OF TARTAR. (*Potassæ Bitartras*, U. S.)—Exists in the juice of grapes, from which it is deposited during the vinous fermentation, because it is insoluble in alcohol. It incrusts the sides of the wine casks, and is detached in the form of thick cakes of a reddish-gray colour, and sold under the name of *argol*. This, when properly purified, assumes the form of white transparent crystals of pure cream of tartar. It is generally kept powdered. Taste, acid; soluble in sixty parts of cold water, and in fifteen of boiling water.

Effects.—A hydragogue cathartic; also diuretic and refrigerant. Very useful in dropsy; much employed, in combination with jalap, in chronic affections of the joints; and with sulphur in hemorrhoids. Best given in sweetened water, or as an electuary with molasses;—dose, $\bar{3}$ ss to $\bar{3}$ j.

ROCHELLE SALTS. (*Sodæ et Potassæ Tartras*, U. S.)—Made by adding carbonate of soda to cream of tartar. Occurs in large, white, transparent, prismatic crystals of unequal sides; efflorescent; very soluble in water; taste less unpleasant than most of the others. It is one of the best of the saline cathartics. Dose $\bar{3}$ j to $\bar{3}$ iss.

The *Seidlitz powders* consist of a mixture of $\bar{3}$ ij Rochelle salts, and $\bar{3}$ ij bicarbonate of soda in one paper, and 35 grs. tartaric acid in another paper; each paper to be dissolved in a separate tumbler, and the two mixed, when effervescence occurs from the escape of carbonic acid, and the patient swallows a mixture of Rochelle salts and tartrate of soda.

PHOSPHATE OF SODA. (*Sodæ Phosphas*, U. S.)—Prepared by the action of sulphuric acid on bone earth, which consists of carbonate and phosphate of lime; sulphate of lime is thrown down, and superphosphate of lime remains in solution; this is now to be decomposed by carbonate of soda. Occurs in large, rhombic, transparent crystals; very efflorescent; contain more than 50 per cent. of water of crystallization; taste resembles that of common salt; soluble in water;—dose, $\bar{3}$ j to $\bar{3}$ ij. Particularly applicable to cases of children, but not much used on account of its expense.

ENEMATA.

Purgative injections are very useful, particularly to act on the lower bowels, and when there is irritability or inflammation of the stomach. The common *laxative enema* is composed of a tablespoonful of salt, molasses, and lard, each, with a pint of warm water; it may be rendered more active by the addition of castor oil, or the

infusion of senna. Turpentine and assafœtida are useful in tympanitis. Cold water alone is frequently employed in constipation. Large quantities of warm water are useful, by the mere distension produced.

CLASS XII.

DIURETICS.

DIURETICS are medicines which increase the secretion of urine. Their action is much influenced by the external temperature, being promoted by cold, and diminished by heat. The two functions of the skin and kidneys are opposed one to the other,—whatever favours one secretion interfering with the other, and *vice versâ*. Their action is also influenced by that of the bowels; free catharsis being always opposed to diuresis.

Diuretics may act, 1, either by being absorbed and coming into direct contact with the kidneys; 2, by promoting absorption into the blood-vessels; 3, by a stimulating impression on the mucous membrane of the urinary passages. Sometimes stimulant and tonic articles prove diuretic by the increased quantity of blood sent to the kidneys in a given time; certain mental emotions have also a powerful effect, as fear and anxiety.

They are used chiefly in dropsies, and in inflammations and irritations of the urinary organs, after proper depletion. As a class, they are rather uncertain in their action.

Diuretics may be divided into several classes; as the Saline, Alkaline, Acid, and Sedative. Dr. Golding Bird makes two divisions,—*renal hydragogues*, or such as merely increase the watery portion of the urine, and *renal depurants*, or those which increase the solid constituents of the urine; the latter include the saline and alkaline diuretics.

SALINE DIURETICS.

CREAM OF TARTAR. (*Potassæ Bitartras*, U. S.)—Exists in various vegetable juices, particularly that of the grape. Procured from wine casks during the vinous fermentation; the salt being insoluble in alcohol, is gradually deposited as a crust on the sides of the cask. In its crude form it constitutes the *argol* of the shops, of a reddish colour. Purified by repeated solutions. When pure, it is perfectly white, crystalline, has an acid taste, more soluble in hot than cold water. It is an excellent hydragogue cathartic, and also diuretic.

Well adapted to dropsies of an inflammatory type, from its possessing refrigerant properties. Should be given in a large quantity of cool water. Dose, \mathfrak{zj} to \mathfrak{zij} daily.

ACETATE OF POTASSA. (*Potassæ Acetas*, U. S.)—Prepared by action of distilled vinegar on carbonate of potassa. Very deliquescent, soluble in water and alcohol; formerly named *sal diureticus*; acts as a cathartic in large doses; produces diuresis in doses of \mathfrak{vj} to \mathfrak{zj} , every two or three hours, in a large quantity of water; used as the former.

NITRATE OF POTASSA.—Already spoken of under the head of refrigerants. Sometimes powerfully diuretic, especially when the surface is kept cool: used in the same cases as the two former. Dose, 10 to 20 grains, repeated, so that from \mathfrak{zj} to \mathfrak{zij} may be taken in twenty-four hours.

ALKALINE DIURETICS.

CARBONATE OF POTASSA. (*Potassæ Carbonas*, U. S.)—Prepared from pearlash by dissolving in cold water, filtering, and evaporating, at the same time stirring so as to cause it to granulate, the object of which is to expose as small a surface as possible to the air, and thereby prevent deliquescence. It contains impurities, as the silicate, sulphate, and muriate of potassa.

The purest carbonate, called *salt of tartar*, is made by heating two parts of cream of tartar with one of nitre.

Occurs in the form of small, white globules, of a nauseous, alkaline taste. It is a decided diuretic; used chiefly as an adjuvant, in dropsy accompanied with acidity of stomach; also as an antilithic in gravel. Dose, 10 to 20 grains, three or four times a day; may be given in carbonic acid water.

The *bicarbonate* (*Potassæ Bicarbonas*, U. S.) is prepared by passing carbonic acid through a solution of the carbonate. Occurs in white, flat prisms; inodorous; not so soluble as the carbonate.

Uses.—Same as the carbonate, but preferable on account of its more agreeable taste. Dose, \mathfrak{zss} to \mathfrak{zj} , repeated.

STIMULANT DIURETICS.

SQUILL. (*Scilla*, U. S.)—Bulb of the *Scilla maritima*, a plant growing upon the shores of the Mediterranean Sea. It is a perennial plant, having a large, pyriform bulb, from which spring long, shining green leaves, and a single long flower-stem. There are two varieties, the *white* and the *red*; but they are similar in properties. The bulb is sometimes imported whole, but generally in transverse or longitudinal slices; of a yellowish-white colour; contorted; tough; of a feeble odour, and a bitter, nauseous taste. Im-

parts its virtues to alcohol, water, and vinegar. Contains a peculiar principle called *scillitin*.

Effects.—In moderate doses, stimulant to most of the secretions, particularly the kidneys and lungs. In large doses, it is emetocathartic. Much used in dropsies of an enfeebled character. Often advantageously combined with calomel, and sometimes with digitalis. Dose, 1 to 3 grs., two or three times a day, gradually increased till some obvious effect is produced. As a diuretic, it is usually given in form of pill or powder. The preparations of squill are noticed under the head of *Expectorants*.

MEADOW SAFFRON. (*Colchicum*, U. S.)—*Bulb* and *seeds* of the *Colchicum autumnale*; a native of Europe; grows about 6 or 7 inches high. Bulb about the size of a chestnut, covered with a brownish membrane; internally, solid, white, and fleshy. It should be gathered in July or August. Sometimes the bulb is dried whole, but generally it is cut into transverse slices about an eighth of an inch thick, whitish, inodorous, of a bitter and acrid taste. The pieces should each have a notch on one side. Apt to be spoiled in keeping; hence very uncertain, as found in the shops. The seeds are small, of a reddish-brown colour and of a bitter, acrid taste; the virtues reside in the outer coating. The seeds contain all the virtues of the bulb, and are less apt to be injured by keeping. It contains a peculiar alkaline crystalline principle, called *colchicina*, not identical with veratria, as was at one time supposed. The virtues are best imparted to wine and vinegar.

Effects.—Stimulant to most of the secretions; rather reduces the action of the heart and arteries; seems also to influence the nervous system. In very large doses it is irritant to the stomach and bowels. It is chiefly used in gout and rheumatism, in which it may be combined with saline cathartics and antacids. *Scudamore's Mixture* consists of a draught containing 15 to 20 grs. magnesia, ʒj to ʒij sulph. magnesia, and fʒj to fʒij vinegar of colchicum. Dose of the bulb or seeds, gr. j–ij, rarely used.

Vinum Colchici Radicis, U. S.—Contains half a pound of the bruised bulb in a pint of wine; colour, dark reddish-brown; dose, 30 drops up to fʒj, gradually increased.

Vinum Colchici Seminis, U. S.—Is made by macerating ʒij bruised seeds in a pint of wine for 14 days; dose, the same.

Acetum Colchici, U. S. (*Vinegar of Colchicum*),—made by macerating the bulb in vinegar, then adding alcohol. Dose, gtt. xx. —xxx.

Tinctura Colchici Seminis, U. S.—Dose, same as the above.

Extractum Colchici Aceticum, U. S.—A good preparation. Dose, gr. i–ij, three or four times a day.

The *White Hellebore of Europe* (*Veratrum album*), and the *Green*

Hellebore of the U. S. (*Veratrum viride*), are analogous in their properties to colchicum. Both depend for their activity upon a powerful alkaline principle called *veratria*. *Veratria* is occasionally employed externally in the form of ointment, in cases of neuralgia. It is a violent acrid poison; even its external application is attended with a burning, tingling sensation.

The *ointment* is made by rubbing up 10 or 20 grs. with an ounce of lard. The dose of *veratria* is the twelfth to the sixth of a grain.

TURPENTINE. (*Terebinthina*, U. S.)—Juice of different species of the *Pinus*, *Abies*, and *Larix*. Many varieties of turpentine are known in commerce, but only two are used in the United States.

1. *White Turpentine* (*Terebinthina*, U. S.)—Derived chiefly from the *Pinus palustris*, or long-leaved pine of the South. Grows from 60 to 70 feet high; the leaves are in threes, about a foot in length. The turpentine is collected by making incisions in the trunk of the tree in spring, when the juice exudes, and is collected in barrels. It hardens on exposure. Colour, yellowish-white; odour, peculiar; taste, hot, bitter and pungent, depending on the volatile oil.

2. *Canada Turpentine* (*Terebinthina Canadensis*, U. S.)—Sometimes called *Balsam of Fir*, and *Canada Balsam*; product of the *Abies balsamea*, or *Balm of Gilead*; found in vesicles under the bark. It is a transparent, yellow, thick liquid; odour, terebinthinate and aromatic; taste, same as the former.—All the turpentines are inflammable, scarcely soluble in water, soluble in alcohol; chemical composition, a resin and a volatile oil.

Uses.—In chronic rheumatism, and chronic disorders of the urinary organs; also, externally, as stimulants to indolent ulcers. Dose, gr. x to 3j. Sometimes given by enema.

The *oil of turpentine*, already alluded to under the head of Arterial Stimulants, is more frequently employed as a diuretic in chronic nephritic complaints; dose, 10 to 20 drops.

Tar (*Pix Liquida*, U. S.)—Procured chiefly from the *Pinus palustris* of North Carolina, by the slow combustion of the wood arranged in large piles. It is an empyreumatic product, consisting of a resin held in solution by acetic acid and empyreumatic oil, and coloured by charcoal: slightly soluble in water; more so in alcohol and ether. The aqueous solution—*tar water*—is used in chronic pectoral complaints. The *vapour* of tar is employed for the same affections, by inhalation.—Dose, internally, ʒss to 3j.

The *ointment* of tar is officinal;—used in tinea capitis.

Pitch is the residue after the volatile parts are driven off from tar;—used in plasters.

Cresote (*Creasotum*, U. S.)—Is one of the ingredients in the volatile oil of tar. Colourless when pure, of an oily aspect, very

volatile; odour, strong, peculiar, and empyreumatic; taste, hot and acrid; slightly soluble in water; much more so in alcohol. *Uses*.—Antiseptic, styptic; employed in sickness of stomach and in hæmatemesis; dose, 1 drop every half hour, or hour. Used externally as a stimulant; also in the form of ointment.

Resin (Resina, U. S.).—The residue after the distillation of the oil of turpentine; two varieties—the *yellow* and *white*.

Uses.—Chiefly to form plasters.

Resin Cerate.—*Basilicon Ointment (Ceratum Resinæ, U. S.)*.—An excellent stimulant application to ulcers arising from burns.

Emplastrum Resinæ, U. S. (Adhesive Plaster.)

COPAIVA. (Copaiba, U. S.).—Product of the *Copaifera officinalis*, a tree of South America. Procured by making incisions in the tree. As it flows first, it is clear, but becomes thick and dark by exposure; colour, orange-red; odour, peculiar and strong; taste, hot and bitter; insoluble in water, soluble in alcohol. Chemically, a volatile oil and an acid resin called *copaivic acid*; virtues depend on the oil, which may be separated by distillation. Copaiva will solidify, if exposed to the air in thin layers; also if rubbed up with magnesia.

Uses.—A stimulant diuretic, sometimes producing nausea and vomiting; acts also upon the mucous membranes generally. Employed chiefly in gonorrhœa, before or after the inflammatory symptoms; also in chronic dysentery, and chronic bronchitis.

Dose, 10 drops to ʒss, 3 times a day; of the volatile oil (*Oleum Copaibæ, U. S.*), 5 to 10 drops. Copaiva is often given in the form of capsules.

Pilulæ Copaibæ, U. S., are made by rubbing up copaiva with magnesia. Dose, gr. x–xx.

CANTHARIDES. (Cantharis, U. S.).—History, &c., described under the head of *Epispastics*. As a diuretic it is more stimulating than the preceding, being apt to irritate the urinary organs, and produce strangury. Used chiefly in chronic disorders of the urino-genital organs, as chronic gonorrhœa and leucorrhœa, incontinence and retention of urine, spermatorrhœa, and amenorrhœa; also in obstinate skin diseases. Dose, gr. j, two or three times a day; generally given in the form of *tincture (Tinct. Cantharidis, U. S.)*,—dose, 10 drops, gradually increased till some obvious effect is produced.

MILDER DIURETICS.

JUNIPER BERRIES. (Juniperus, U. S.).—Fruit of the *Juniperus communis*, an evergreen shrub, growing in both continents;—about the size of a pea, globular, of a dark-purple colour, glaucous and

shrivelled. Imported chiefly from Trieste. Odour, aromatic; taste, sweetish, warm, and terebinthinate; virtues depend on a volatile oil, and are yielded to water and alcohol.

Effects.—A good, moderately stimulant diuretic and carminative; used chiefly as an adjuvant;—with cream of tartar, as a drink, in dropsy. The *infusion* contains ℥j of the bruised seeds to Oj of water. Dose of the *oil* (*Oleum Juniperi*, U.S.), 5 to 15 drops, several times a day.—*Spiritus Juniperi Compositus*, U.S., is an alcoholic solution of the oils of juniper, caraway, and fennel.—The tops are also occasionally used in medicine.

INDIAN HEMP. (*Apocynum Cannabinum*, U.S.)—Root of the *A. cannabinum*, an indigenous, herbaceous plant, emitting a milky juice when wounded. Odour, strong; taste, bitter and nauseous; virtues to water and alcohol. In full doses acts as an emeto-cathartic; occasionally a very powerful diuretic in some cases of dropsy. Dose of the decoction (℥ss in Oijj water, boiled down to Oj), f℥j to f℥ij, three times a day.

DANDELION. (*Taraxacum*, U.S.)—Root of the *Leontodon taraxacum*, an herbaceous, perennial plant. The root is spindle-shaped, several inches long, of a brownish colour externally, lighter within; all parts abound in a milky, bitterish juice, particularly the root, which is more powerful in the fresh state.

Effects.—Tonic, diuretic, and laxative; believed to have a specific influence over the liver; used in dyspepsia attended with derangement of the liver; and in certain forms of dropsy.

Infusion. (*Infusum Taraxaci*, U.S.)—℥j of the fresh, or ℥ij of the dried root, in Oj water;—dose, f℥ij several times a day.

Extract. (*Extractum Taraxaci*, U.S.)—Prepared by bruising the fresh root, straining, and evaporating;—dose, 20 to 30 grs.

FLEABANE. (*Erigeron*, U.S.)—Herbaceous parts of the *E. heterophyllum*, and *E. Philadelphicum*, indigenous plants. They are gently diuretic, and are chiefly employed as adjuvants in dropsy, and in chronic nephritic disorders. Best given in decoction, (℥j to Oj water,)—the whole to be taken in the course of the day.

WILD CARROT. (*Carota*, U.S.)—Seed of the *Daucus carota*, an indigenous, perennial plant. The flowers are in umbels, which are flat at first, but afterwards contract so as to form a cup. The seeds are brownish, of an oval shape, with stiff hairs attached. Odour, slight; taste, aromatic and bitter; contain a volatile oil, which may be separated by distillation.

Effects.—A moderately stimulant diuretic; used as an adjuvant in dropsy, in the form of infusion.

The garden carrot has similar properties, though feebler. It is sometimes used, grated, as a poultice.

PARSLEY ROOT. (*Petroselinum*.)—Has also diuretic properties;

the same is true of *Horseradish* and *Mustard*. Sometimes an infusion of several of these is given, in cases of dropsy of an enfeebled character.

SWEET SPIRITS OF NITRE. (*Spiritus Ætheris Nitrici*, U. S.)—Prepared by the action of sulphuric acid on alcohol and nitrate of potassa, by distillation; chemically, the hyponitrite of ethyl, dissolved in alcohol.

Prop.—Colourless, limpid, of an ethereal odour, and a pungent, sweetish taste; apt to deteriorate when kept, becoming acid; soluble in alcohol and water; apt to be impure, as found in the shops. It is diaphoretic, diuretic, and antispasmodic; much used in fevers with nervous irritability, especially for children. Dose, 20 drops to fʒj, every 2 or 3 hours.

The only *sedative* diuretic much employed is *Digitalis*. It does not succeed so well in dropsies attended with much plethora, as in those of a relaxed debilitated character. It is useful in cases accompanied with albuminous urine. Its diuretic powers are increased by combining it with squill and calomel. It is not very speedy in its operation, generally requiring several days to produce its diuretic effect. Dose of powder, one grain twice a day; of the tincture, 10 drops; of the infusion, fʒss.

CLASS XIII.

DIAPHORETICS.

DIAPHORETICS are medicines which increase the function of perspiration. The name *sudorifics* is often applied to such as increase the sensible perspiration or *sweat*. They act in different ways: (1) by relaxing the surface; (2) by direct stimulation of the sudoriferous glands; (3) by stimulating the system generally; (4) by sympathy from the stomach; (5) by filling the blood-vessels. As a class of medicines, their action is not very certain, depending a good deal upon the state of the system at the time, and also upon the temperature and hygrometric condition of the atmosphere. They are useful as evacnants, promoting at the same time absorption; they also produce revulsion to the surface. Diaphoretics may be divided into the *refrigerant*, the *nauseating*, and the *alterative*.

REFRIGERANT DIAPHORETICS.

CITRATE OF POTASSA. (*Potassæ Citras*, U. S.)—Prepared by action of citric acid, or lemon-juice, on carbonate or bicarbonate of potassa. A white, soluble, deliquescent salt; used as a diaphoretic in fevers, particularly in the forms of *neutral mixture* and *effervescing draught*.

Neutral Mixture. (*Solutio Potassæ Citratis*, U. S.)—Prepared by saturating lemon-juice (or an ounce of citric acid, rubbed up with four minims of oil of lemons, and dissolved in a pint of water), with carbonate, or preferably, the *bicarbonate* of potash, and filtering. Dose, a tablespoonful every hour or two: this quantity contains 15 grains of the salt.

The *effervescing draught* is the same, given in a state of effervescence. It is made by dissolving ℥ij of the carbonate, or ℥iij of the bicarbonate in f℥iv water; then add a tablespoonful of this solution, mixed with the same quantity of water, to a tablespoonful of sweetened lemon-juice, or citric acid solution. Laudanum, in small quantities, may be added, if it produces griping.

SPIRIT OF MINDERERUS. (*Liquor Ammonice Acetatis*, U. S.)—Prepared by the action of distilled vinegar on carbonate of ammonia. A limpid, colourless liquid, when properly made; taste, cooling and bitterish; an excellent diaphoretic in fevers. Dose, a tablespoonful every hour or two.

NITRATE OF POTASSA,—already spoken of as a refrigerant. It will frequently produce diaphoresis, especially if combined with other medicines of this sort; the *Nitrous Powders* are a combination of tartar emetic, nitre, and calomel. Nitre and tartar emetic are often prescribed, as a diaphoretic, in solution.

NAUSEATING DIAPHORETICS.

The Nauseating Diaphoretics comprise such medicines as produce diaphoresis, by relaxing the cutaneous capillaries; in this way, nearly all emetic substances will promote perspiration, if given in small doses. The only ones much employed are, *Ipecacuanha* and *Tartar emetic*. They are indicated in all cases of high arterial excitement, not attended with irritation or inflammation of the stomach.

Tartar emetic is usually given in the dose of the sixth to the twelfth of a grain. *Ipecacuanha* is chiefly used as a diaphoretic, in combination with opium, in the form of *Dover's Powder*—(*Pulvis Ipecac. et Opii*, U. S.)—This is made by rubbing up one part of ipecac. and opium each, with eight parts of sulphate of potassa; the dose is 10 grains. It is a very useful anodyne diaphoretic, in rheumatism, diarrhœa, and dysentery; also in pneumonia and bronchitis, after proper depletion; it should not be used, if there be much arterial excitement, or determination to the head.

ALTERATIVE DIAPHORETICS.

The chief Alterative Diaphoretics are Sassafras, Mezereon, Guaiacum, and Sarsaparilla.

SASSAFRAS, U. S.—Bark of the root of the *Sassafras officinale*, an indigenous tree. Occurs in irregular fragments, of a reddish cinnamon-colour, brittle, of a very aromatic odour and taste. Virtues depend on a volatile oil. It is a mild stimulant diaphoretic, used chiefly in domestic practice; not much employed alone, but forms an agreeable adjuvant to other medicines. It is one of the ingredients in the *Compound Decoction of Sarsaparilla*.

The *sassafras pith* (*Sassafras Medulla*, U. S.) is procured from the young twigs. It is in cylindrical pieces, white, and very light; forms with water a thick, gummy solution. The mucilage is made by adding ℥j to Oj of boiling water; it is a very pleasant application to irritated or inflamed surfaces, as in ophthalmia, crysipelas, eczema, &c.

MEZEREON. (*Mezereum*, U. S.)—Product of several species of the *Daphne*, especially the *D. mezereum*, a shrub three or four feet high, growing in Europe. The bark of the root is the part directed by the Pharmacopœias, but the bark derived from the branches is generally found in the shops. It comes in strips three or four feet long, folded in bundles, or wrapped in balls; covered externally with a grayish-brown epidermis, whitish within, tough and pliable. Taste, sweetish at first, then very acrid; it yields its properties to boiling water. It contains a peculiar principle called *daphnin*, which, however, is not active: its activity depends on an acrid resin. The fresh bark applied to the skin will produce vesication. An ointment (*Unguentum Mezerei*, U. S.), made from the bark, is used to maintain the discharge from blisters.

Mezereon is a stimulant alterative diaphoretic, if directed to the skin; it will act also on the kidneys. Used chiefly in combination with others, in chronic skin diseases, chronic rheumatism, and secondary syphilis. Best given in the form of *decoction*, made by boiling ℥ij mezereon, and ℥ss liquorice root, in Oij water, down to Oij. Used sometimes as a *masticatory* in cases of paralysis of the tongue.

GUAIACUM WOOD, AND GUAIAC. (*Guaiaci Lignum et Guaiaci Resina*, U. S.)—Products of the *Guaiacum officinale* (Fig. 23), an evergreen tree of South America and the West Indies. The wood comes in billets, covered with a grayish bark, extremely hard and compact; the alburnum, or sap wood, is of a yellowish colour; the heart wood of a brownish-green; commonly called *lignum vitæ*. It has no odour except when rubbed or burned; taste, bitterish and pungent; activity depends on the contained guaiac.

Guaiac (resin) is procured either by spontaneous exudation, or

by boiling the raspings and shavings in water, or by heating in the fire billets of the wood which have been bored longitudinally. It comes in masses of a deep olive-brown colour, mixed with various impurities; fracture resinous; odour feeble and balsamie; taste

Fig. 23.



slight at first, but afterwards acrid; melts by heat, evolving a fragrant odour. Chemically, a mixture of a peculiar extractive, called *guiacine*, and a resin; much more soluble in alcohol than in water.

Effects.—Stimulant, alterative, and diaphoretic; in large doses irritant to the bowels. Used in chronic rheumatism, secondary syphilis, and chronic skin diseases. Dose of guaiac, 10 to 30 grains. There are two tinctures, the *simple* and the *volatile* or *ammoniated*; the latter is used in dysmenorrhœa;—dose of either, f3j.

SARSAPARILLA, U. S.—Root of different species of the genus *Smilax*, as the *S. officinalis*, *S. sarsaparilla*, *S. syphilitica*, &c.; perennial, climbing plants, growing in Mexico and South America. The leaves are ovate, and alternately inserted upon short footstalks, with numerous tendrils proceeding from the stem. The roots are very long and slender, inserted upon a common caudex. Several varieties are known:—1. *Honduras sarsaparilla*,—comes in bundles two or three feet long, consisting of one or more roots, folded lengthwise, and secured by a few circular turns. 2. *Jamaica sarsaparilla*,—distinguished by the reddish colour of its epidermis, probably of similar origin with the last. 3. *Brazilian*, or *Para sarsaparilla*, sometimes called *Lisbon* and *Rio Negro sarsaparilla*,—this comes in cylindrical bundles, about three feet long and one thick; it is an excellent variety. There are also the *Caraccas* and *Mexican* varieties.

The dried root has but little odour; a mucilaginous and acrid

taste, especially when chewed for some time; imparts its virtues to water and alcohol; the cortical portion is the most active. It contains a peculiar principle, called *sarsaparillin* or *smilacin*, also much starch, lignin, &c. Long boiling is injurious to it.

Effects.—An alterative diaphoretic; sometimes creates nausea and vomiting. Improves the state of the constitution; slightly strengthens and induces plumpness in cachectic cases, and in depraved states of the general health. Useful in secondary syphilis, chronic rheumatism, chronic cutaneous diseases, &c. It is not often administered alone; generally in combination with the other stimulating diaphoretics. Dose of powder, ℥ss to ʒj; of the *Infusion* (*Infusum Sarsaparillæ*, U. S.), made by macerating ʒj of the root in a pint of boiling water, fʒiv. The *Compound Decoction* (*Decoctum Sarsaparillæ Compositum*, U. S.), is made by boiling together bruised sarsaparilla with guaiacum wood, mezereon, liquorice root, and sassafras, in water, for fifteen minutes, and then straining. It is made in imitation of the *Lisbon diet drink*. Dose, fʒiv several times a day. The *Compound Syrup* (*Syrupus Sarsaparillæ Compositus*, U. S.) is also officinal,—an excellent preparation; it contains sarsaparilla, guaiacum wood, red roses, liquorice root, the oils of sassafras, anise, and partridge-berry. Dose fʒss, three times a day.

The *Fluid Extract* (*Extractum Sarsaparillæ Fluidum*, U. S.) is made by macerating bruised sarsaparilla, liquorice root, sassafras bark, and mezereon, in dilute alcohol for fourteen days, then filter, add sugar, and evaporate down to the requisite bulk. It is a strong and certain preparation; dose, fʒi–ij.

The root of *Aralia nudicaulis*, or *False Sarsaparilla*, an indigenous plant, possesses kindred properties to those of sarsaparilla. *Uses*, the same.

CLASS XIV.

EXPECTORANTS.

MEDICINES which increase or promote the evacuation of the bronchial secretions. In the healthy condition there is a certain amount of secretion always going on in the air passages, which is removed by evaporation or absorption; but in disease of these organs, there is either an arrest of the natural secretion, or it becomes excessive, and *cough* results.

Some expectorants are thought to act by producing relaxation, as

the nauseating expectorants; others by stimulating the mucous exhalants; some, possibly, by sympathy from the stomach. The nauseating class are alone indicated in cases of inflammatory or febrile excitement; the stimulating, in cases of enfeebled action, or when of long duration. *Anodynes* are useful adjuvants, when the expectoration is attended with pain.

NAUSEATING EXPECTORANTS.

The *emetics*, generally, prove expectorant, in consequence of the relaxation produced; only two, however, are much employed with this view, *tartar emetic* and *ipecacuanha*; the dose of the former is $\frac{1}{2}$ grain, or of *antimonial wine*, 15 to 25 drops every two hours; the dose of *ipecacuanha* is gr. ss-j, or of the wine, 25 to 30 drops.

STIMULANT EXPECTORANTS.

SENEKA. (*Senega*, U. S.)—Root of the *Polygala senega*, indigenous in the United States. A small, herbaceous perennial, with alternate smooth leaves. The root consists of a thick, knotty head, with the radicles much twisted, with a projecting, keel-like line. Colour, yellowish-brown externally, whitish within. The cortical portion contains the active principle, named *sene-gin* or *polygalic acid*. Odour, peculiar; taste, at first sweetish and mucilaginous, then acri-d. Water and diluted alcohol extract its virtues.

Effects.—A stimulant expectorant, and diuretic; large doses act as an emeto-cathartic; sometimes also produce diaphoresis and emmenagogue effects. Used as an expectorant, where there is no inflammation; in latter stages of bronchitis, humoral asthma, secondary croup, &c. An ingredient in *Coxe's Hive Syrup*. Dose, 10 to 20 grains;—of the decoction (*Decoctum Senegæ*, U. S.; $\mathfrak{z}\text{j}$ to Oiss water down to Oj) $\mathfrak{f}\mathfrak{z}\text{j}$ to $\mathfrak{f}\mathfrak{z}\text{ij}$, three times a day;—of the syrup (*Syrupus Senegæ*, U. S.), $\mathfrak{f}\mathfrak{z}\text{j}$.

Fig. 24.



SQUILL.—Already described as a *diuretic*. As an expectorant, it much resembles senega, and is used in similar cases. May be advantageously combined with ipecacuanha, or tartar emetic. Dose, gr. j, several times a day;—of the *vinegar*, fʒss to fʒj;—of the *syrup* or *oxymel*, the same dose;—of the *tincture*, 20 to 40 drops. *Coxe's Hive Syrup* (*Syrupus Scillæ Compositus*, U. S.), contains equal parts of squill and senega, together with tartar emetic; much used in croup, catarrh, and hooping-cough; dose for a child, 10 drops to fʒj, according to the age.

BLACK SNAKE-ROOT. (*Cimicifuga*, U. S.)—Root of the *Cimicifuga racemosa*, sometimes called *cohosh* and *richweed*, an indigenous perennial plant, several feet high, having ternate leaves, and long racemes of white flowers. The root consists of a tuberculated caudex, several inches long, from which numerous slender, brittle radicles proceed. Colour, blackish; odour, feeble; taste, bitter, earthy, and astringent. Virtues to boiling water; strongest when fresh.

Effects.—Not especially an expectorant, but a general tonic and stimulant to the secretions, especially of the lungs, skin, and kidneys. In very large doses, it seems to affect the brain. Used in rheumatism, hysteria, and pulmonary disorders; also an excellent remedy in chorea. Dose of *decoction* (ʒj to Oj water), a teacupful, several times a day.

GARLIC. (*Allium*, U. S.)—Bulb of the common garlie, *Allium sativum*. It is about an inch in diameter, flattened, is covered by a membrane, and consists of several small conical bulbs, arranged round a common stem, called *cloves*. Odour, strong; taste, acrid and bitter, depending on a volatile oil, which is of a yellow colour, extremely acrid and irritating. The expressed juice is the best for internal use; to be given mixed with sugar. Dose, fʒss to fʒj.

Used in chronic catarrhs, asthma, &c. Sometimes employed externally, as a poultice to the feet of children.

ASSAFÆTIDA.—As an expectorant, a good deal resembles *garlic*. A valuable remedy in coughs of a nervous character, as hooping-cough, spasmodic asthma, infantile coughs, and coughs of old people. Dose, 5 to 15 grains, given in pill or emulsion.

AMMONIAC. (*Ammoniacum*, U. S.)—Inspissated juice of the *Dorema ammoniacum*, an umbelliferous plant of Persia. Found in *tears* and in *masses*; the former is the purest; occurs in pieces of various size, spheroidal; of a reddish-yellow colour externally; brittle when cold; of a resinous fracture. The masses are of a darker colour, and contain many impurities. Odour, peculiar, increased by heating it; heat softens, but does not melt it; taste, bitter, nauseous, and acrid; chemically, a gum-resin and volatile

oil, partially soluble in water and in alcohol; forming, with the former, a milky emulsion, and with the latter, a clear tincture.

Effects.—Similar to those of assafoetida, and the other fetid gum-resins. Used chiefly as a stimulant expectorant, in chronic enfeebled cases. Dose, 10 to 30 grains.

Pilule Scille Composite, U. S.—Contain squill, ammoniac, ginger, and soap;—dose, 5 to 10 grains, several times a day.

Externally applied, ammoniac causes irritation of the skin. Used sometimes as a plaster (*Emplastrum Ammoniacy*, U. S.)

GALBANUM, U. S.—A substance much resembling ammoniac in its medical properties; not much used except for making plasters.

BENZOIN. (*Benzoinum*, U. S.)—The product of *Styrax Benzoin*, a native of Siam and Malacca. The juice which exudes on incision, hardens on exposure. It is a balsam, used for obtaining benzoic acid.

BALSAM OF TOLU. (*Balsamum Tolutanum*, U. S.)—Product of the *Myrospermum Toluiferum*, or *Myroxylon Toluiferum*, growing in South America.—Procured by making incisions into the tree. When first procured, it is of a soft, tenacious consistence, but becomes hard and darker by exposure; odour, very fragrant; taste, pleasant and sweetish; inflames by heat; soluble in alcohol, ether, and the fixed oils; boiling water extracts its benzoic acid; chemically, it consists of benzoic acid, volatile oil, and cinnamic acid. The acid may be separated by sublimation;—it is used in making the *paregoric elixir*.

Effects.—A stimulant expectorant; used in chronic pulmonary complaints; a pleasant adjuvant to cough mixtures; dose, 10 to 30 grs. The *tincture* (*Tinc. Tolutana*), and *syrup* (*Syrupus Tolutanus*), are officinal; the latter used to flavour cough mixtures.

BALSAM OF PERU. (*Balsamum Peruvianum*, U. S.)—Product of the *Myroxylon Peruiferum*, or *Myrospermum Peruiferum*, growing in South America.—Believed to be procured by boiling the young branches; supposed by some, that both the balsams are the product of the same tree, one being obtained by exudation, the other by decoction. A thick, viscid fluid, resembling molasses; colour, dark reddish-brown; odour, fragrant, less pleasant than that of Tolu; taste, warm, bitter, and pungent; inflammable; yields its benzoic acid to boiling water; chemical composition, the same as that of Tolu.

Effects.—A warm stimulating expectorant and tonic, adapted to the same cases as the preceding; used sometimes externally to indolent ulcers. Dose, f3ss.

CLASS XV.

EMMENAGOGUES.

MEDICINES which promote the menstrual discharge. It is questionable whether there are any medicines which *specifically* affect the uterus; most of them seeming to act by contiguous sympathy. As amenorrhœa is sometimes a primary disease, and sometimes the result of other causes, the treatment must, in the first place, be directed to the restoration of the constitution to a natural state; in plethoric cases, depletion will be required; in the relaxed, a tonic course. Emmenagogues are usually most efficient when given just before the expected period of the discharge.

SAVIN. (*Sabina*, U. S.)—Leaves of the *Juniperus sabina*, an evergreen shrub, indigenous to Europe, and cultivated in the United States. It resembles in appearance the red cedar. As found in the shops, the leaves are of a greenish colour, strong, heavy odour, and bitter and acrid taste; active properties depend on a yellow volatile oil.

Effects.—A stimulant to the secretions generally; over-doses are very irritant, and even poisonous; by some highly esteemed as an emmenagogue; its use very dangerous in pregnancy, in consequence of the irritation or inflammation of the uterus produced, bringing on abortion. It is questionable whether it has the power of directly exciting uterine contraction. Dose, 5 to 20 grs.; of the oil, 2 to 5 drops, three times a day;—acts as a rubefacient, when applied to the skin.

Most of the drastic cathartics will prove emmenagogues, probably through the sympathy existing between the bowels and uterus. The two most employed, are *aloes* and *black hellebore*.

ALOES is one of the most efficient remedies in amenorrhœa, particularly when combined with iron and assafœtida. It is contra-indicated in cases of inflammation or hemorrhoids. Dose, 1 or 2 grs., two or three times a day.

BLACK HELLEBORE—an uncertain emmenagogue, as found in the shops; usually given in the form of tincture; dose, fʒss to fʒj, two or three times a day.

GUAIAC is by many highly recommended in amenorrhœa. Dr. Dewees praises it also in dysmenorrhœa. Best given either in the form of *tincture*, or *ammoniated tincture*; dose fʒj, three times a day.

SENEKA is also esteemed emmenagogue by some writers; it is a

general stimulant to the secretions, and may sometimes promote menstruation.

CANTHARIDES will often produce a decided emmenagogue effect; indicated only in cases of enfeebled action; never in cases of inflammation. Dose of tincture, 10 to 30 drops, three times a day. A blister to the sacrum will sometimes have the same effect.

The *Preparations of IRON* are perhaps the most certain of all the emmenagogues; they are more employed than the others; the *subcarbonate*, or the *sulphate*, usually preferred. They are particularly indicated in cases of chlorosis; never in plethora; often combined with aloes.

CLASS XVI.

SIALOGOGUES.

MEDICINES which promote the secretion of the saliva. Some articles effect this when taken internally, as antimony, silver, nitromuriatic acid, iodine, and especially mercury; others produce it by a topical or local action, as mustard, ginger, tobacco, &c. As remedies, they are employed in paralytic affections of the tongue and throat; in diseases of the tonsils or salivary glands; sometimes as revulsives from neighbouring organs, as in toothache and earache. They are also called *masticatories*. They are all described under other heads.

CLASS XVII.

ERRHINES.

SUBSTANCES which promote the nasal secretion. As they generally excite sneezing, they are also termed *sternutatories*. They all act by direct application; and nearly any foreign substance applied to the mucous membrane of the nose will produce this effect. They are used as revulsives in amaurosis, chronic ophthalmia, &c.; also in syncope; also to promote the discharge of accumulated mucus, and of foreign bodies. The most powerful errhines, are Tobacco, Ammonia, Euphorbium, and Veratria.

CLASS XVIII.

EPISPASTICS.

MEDICINES which, when applied to the skin, produce a blister. Called also *vesicatories*. The Rubefacients will also blister if applied for a sufficient length of time.

Effects.—They act as general stimulants to the system; and are useful in typhoid cases; they will sometimes set aside a paroxysm of intermittent or remittent fever, by virtue of the powerful impression produced. They are powerfully revulsive, and are used in diseases of the internal organs. It is advisable not to employ them in the very height of inflammatory diseases, lest the excitement should be increased. They produce local depletion by the serous discharge which they occasion. They also do good in certain cases, by substituting their own action, which spontaneously subsides, for some morbid action in the part, as in obstinate herpes, &c. They are also employed for their local stimulant action; for the pain which they cause, in hypochondriasis; and to procure a denuded surface for the endermic application of medicines.

SPANISH FLIES. (*Cantharis*, U. S.)—The *Cantharis vesicatoria* is an insect from six to ten lines in length, by two or three in breadth, of a shining green colour. They abound in the south of Europe, and are collected in the summer by shaking them from the trees in which they lodge, and letting them fall into large cloths, which are plunged into hot vinegar and water, for the purpose of destroying the insects: they are then perfectly dried in the sun, and put into canisters. Odour, strong and peculiar; taste, acrid and burning; colour of powder, grayish-brown, with fragments of shining green. Should not be kept in the powdered state, as it is very apt to attract moisture and decompose. Apt to be attacked by insects; virtues to water and alcohol. Contain a peculiar crystalline principle called *cantharidin*.

Effects.—Internally, a diuretic and emmenagogue; externally, it forms the best epispastic. The following are its preparations:

Ceratum Cantharidis, U. S.—(*Blistering Plaster*.)—Made by mixing together yellow wax, rosin, lard, and powdered flies. This is the preparation used for spreading blisters. Soft leather, muslin, or paper may be employed, and the cerate applied with a spatula, without heat. The shape and size of the blister must be determined by the part to which it is to be applied. Sometimes a thin gauze is interposed between the skin and cerate, which is thought to prevent the absorption of the active principle. From six to eight hours is

sufficiently long to allow a blister to remain on: if vesication has not then taken place, a warm poultice is to be applied. For children, a much shorter time will suffice. The best *dressing* is simple cerate; or, if to be kept discharging, basilicon ointment; if not disposed to heal, a mixture of Goulard's and simple cerate. The strangury, often resulting from the application of blisters, is best relieved by an anodyne enema, and the free use of diluent drinks.

Unguentum Cantharidis, (U. S.)—Used only for dressing blisters, to maintain the discharge. Prepared by mixing the decoction with resin cerate, and evaporating to a proper consistence.

Emplastrum Picis cum Cantharide, (U. S.)—*Emplastrum calefaciens*, or *warming-plaster*. Prepared by melting together the cerate of cantharides with Burgundy pitch. Used as a gentle rube-facient in chronic cases. It sometimes causes vesication, particularly if improperly made.

Linimentum Cantharidis, (U. S.)—Made by digesting cantharides in oil of turpentine. A very powerful, prompt, and stimulating liniment, and vesicant. Used sometimes in typhus fever.

Other species of the *Cantharis* possess vesicant properties, particularly the *C. vittata*, or *potato-fly*, which is indigenous. It is smaller than the preceding, but resembles it in all its medicinal properties.

CLASS XIX.

RUBEFACIENTS.

MEDICINES which cause inflammation of the skin, when applied externally. The indications for their use, as well as the principles of their operation, are very much the same as those of Epispastics. The latter are preferred when a slow and stimulant effect is desired; the former, where the impression is to be sudden and transient. Rubefacients cannot deplete like blisters; they are likewise inferior in their power of breaking up morbid associations, as in intermittents. As revulsives, rubefacients are most useful in spasms and nervous irritations; blisters, in local inflammations.

BURGUNDY PITCH. (*Pix Burgundica*, U. S.)—*Abies excelsa* or *Norway spruce fir*, a lofty evergreen, native of northern Europe. Procured by stripping off the bark, under which it concretes in large masses; then melting in boiling water, and straining. A spurious pitch is manufactured out of rosin and common pitch.—It

is hard, brittle, and of a yellowish-brown colour, of a weak terebinthinate odour and taste; usually contains many impurities.—Used in the form of *plaster* to the skin, where it produces a mild rubefacient effect. In some persons it brings out a pustular eruption.

The *pitch plaster*, made by spreading the melted pitch on soft leather, is used in chronic pulmonary and rheumatic complaints, &c.

CANADA PITCH. (*Pix Canadensis*, U. S.)—Product of the *Abies Canadensis* or *Hemlock spruce*, a native of Canada and the Northern States. The pitch, sometimes called *hemlock gum*, is a spontaneous exudation on the old trees; it is scraped off, boiled in water, and strained. It is hard and brittle, of a dark brownish colour, and feeble odour; heat softens and renders it adhesive.—Uses, and mode of application, the same as the former.

SOLUTION OF AMMONIA. (*Liquor Ammoniae*, U. S.)—Prepared by saturating water with gaseous ammonia; found in the shops of different strengths. Applied to the skin, it produces a rubefacient, or even epispastic effect very speedily; usually employed in combination with olive oil, in the form of *Linimentum Ammoniae*, U. S., or *volatile liniment*,—made in the proportion of half an ounce of aq. ammonia to two ounces of oil; an excellent mild rubefacient in rheumatism, and catarrh, especially of children; may be farther diluted if too powerful.

Granville's antidynous lotion is made by mixing the strongest liquor ammonia with oil of rosemary and tinct. camphor; it is a very powerful application, and will cause vesication in a few minutes; used in neuralgia, &c.

MUSTARD. (*Sinapis*, U. S.)—Product of two different species, viz.: *Sinapis alba* and *Sinapis nigra* (Figs. 25, 26), natives of Europe. Two kinds of seeds are found, the *white* and the *black*; the former are of a light-yellowish colour, and globular; the latter are smaller, of a dark-brown colour, externally, and whitish within. They have no odour when whole; yield a yellow powder, which is decidedly odorous when moistened; taste, hot, pungent, and bitter; strongest in the black; the outer coating of both is mucilaginous; both yield a mild fixed oil, on pressure. The active principle of the black mustard is a volatile oil, which does not pre-exist in the seed, but is developed by the reaction of water upon two organic principles, named *sinapisin* and *myrosyne*. In the white mustard, the active principle is a fixed acrid substance, which does not pre-exist in the seed, but is generated by the reaction of water on *sulpho-sinapisin* and *myrosyne*.

Swallowed whole, the seeds are stomachic and laxative, and are used in dyspepsia. The powder, in small doses, is stimulant; in large quantities, emetic. Externally applied, it is an active rube-

facient, and is much used under the form of mustard poultice, or *sinapism*,—made by simply stirring up the powder with warm water; flour may be added to dilute it. It should not be allowed to remain on longer than from 15 to 30 minutes; never to produce vesication. Care should be taken not to leave it too long on persons insensible to pain, lest ulceration and sloughing result.

OIL OF TURPENTINE is a powerful rubefacient; used by saturating a flannel and applying it to the skin; sometimes produces a violent inflammation and eruption on the skin.

CAYENNE PEPPER may be advantageously used as a rubefacient, by heating it in spirits, and rubbing it over the surface; particularly applicable in the low forms of disease.

Fig. 26.



Fig. 25.

CLASS XX.

ESCHAROTICS, OR CAUSTICS.

SUBSTANCES which cause a slough by destroying the life of the part to which they are applied. Some of them act directly, others indirectly, through chemical agencies. Used to form issues or running sores, to repress fungous granulations, to change the character of diseased surfaces, and to open abscesses.

The *hot iron*, or *actual cautery*, is the most powerful escharotic; not so much employed at present as formerly; occasionally used to arrest hemorrhage.

The *moxa* is a modification of the actual cautery; it consists of small rolls of muslin soaked in a solution of chromate, or nitrate of

potassa, and dried. When used, one end is set on fire, and the other placed on the skin. It acts as a powerful revulsive;—useful in deep-seated pains, paralysis, disease of spine, &c.

LUNAR CAUSTIC. (*Argenti Nitras Fusus*, U. S.)—Made by dissolving pure silver in diluted nitric acid, evaporating, melting, and running into moulds. It occurs in cylindrical pieces, enveloped in paper to protect it from the light, which decomposes it. Colour, grayish-white; taste, austere and metallic; very soluble. As a caustic, it acts through its chemical affinities for the albumen of the tissue. It is a safe and excellent escharotic; particularly useful to change the character of unhealthy ulcers, whether common or specific; the best application for ulcers of the cornea; also to inflamed tonsils. Sometimes a concentrated solution is preferred. The weak solution is an admirable stimulant application, as already noticed under the head of *Tonics*.

POTASSA, U. S. (*Common caustic*, *Lapis infernalis*.)—Chemically a *hydrate of potassa*; made by adding quicklime to a solution of carbonate of potassa, and evaporating the resulting solution to a proper consistence, and then pouring into proper moulds. Occurs in cylinders of a gray colour; very deliquescent; powerfully alkaline; very soluble. A more powerful caustic than nitrate of silver; apt to extend its effects, and consequently not so safe; used chiefly to form issues, which is best effected by rubbing a moistened stick of potassa over a piece of sticking plaster, applied to the skin, and having a hole in it of the size of the intended issue; sometimes used also to open abscesses, and to destroy poisoned surfaces. The strong solution sometimes applied to the spine, in tetanus.

The *Potassa cum Calce*, U. S. (*Vienna paste*)—is used sometimes to open bubos.

DRIED ALUM. (*Alumen Exsiccatum*, U. S.)—Commonly named *burnt alum*; prepared by heating alum until deprived of its water of crystallization; a dull-whitish powder; a mild escharotic;—used to repress fungous granulations.

SULPHATE OF COPPER.—Usually applied in the solid form; in which state it forms the best remedy in *granulated conjunctivitis*. A strong solution is useful in *cancrum oris*; the weaker solution is a good stimulant, as mentioned under the head of *Tonics*.

ARSENIC. (*Acidum Arseniosum*, U. S.)—Procured in smelting the ores of arsenic; of a milk-white colour; vitreous fracture; transparent within, but becomes opaque on exposure; has no odour; taste, faintly sweetish; powerfully poisonous; soluble in water and alcohol. A dangerous escharotic from liability to absorption.—Used chiefly in cancerous sores; also in lupus, and onychia maligna; should always be very much diluted before applying it.

CORROSIVE SUBLIMATE.—A powerful escharotic in the undiluted state, but seldom thus employed. A weak solution used as a gargle in venereal sore throat, and as a lotion in chronic skin diseases; recommended in onychia maligna, mixed with equal parts of sulph. zinc. More fully described under the head of *Mercury*.

The *solution of the nitrate*, and the *acid nitrate of mercury*, are also used as escharotics; the latter especially in ulcers of the uterus.

The *Mineral acids* are all powerfully caustic in the undiluted form; not used as such, however; but employed, sufficiently diluted, as stimulant washes to indolent ulcers.

CLASS XXI.

EMOLLIENTS.

MEDICINES which soften and relax the skin, when externally applied. They diminish the pain and tension of inflamed parts, often assisting in producing resolution; or, if too far advanced for that, they aid the suppurative process. Their action is believed to be purely mechanical. They all owe their efficacy to moisture; in fact, *water* is, by some, considered the only emollient; a temperature above 62° F. is requisite;—aqueous vapour is still more emollient than warm water. The usual method of applying emollients is by *cataplasm*, of which the best is that made from flaxseed meal. Nearly all the *Demulcents* have an emollient effect when externally applied.

CLASS XXII.

DEMULCENTS.

SUBSTANCES of a bland, unirritating nature, capable of forming a viscid solution with water. They are closely allied to Emollients; in fact, they produce the same effect upon the internal passages as the latter do upon the skin. They consist chiefly of gum, sugar, oil, or starch, and are useful both as adjuvants to other acrid or irritating medicines, and also, when given alone, to defend inflamed or irritated surfaces, with which they come into direct contact, as the stomach and bowels,—when they may be given either by the mouth,

or by enema. Also very much used in inflammations and irritations of parts on which their action must be indirect, as in bronchitis and urinary disorders; in the latter instances, they probably act by being absorbed. Several of the demulcents are much used as articles of diet for the sick. They are also used, in solution, as vehicles for other medicines.

GUM ARABIC. (*Acacia*, U. S.)—Product of several species of *Acacia*, especially the *A. vera*, *A. Senegal*, and *A. Arabica*. They are thorny shrubs, or trees, growing in the deserts of Arabia, Africa, and India. The gum exudes spontaneously and by incisions. The varieties are as follows:—1. *Turkey gum*, imported from the Levant; comes in small, irregular fragments, either whitish, or very light yellowish-red: among these are larger round pieces with numerous cracks, brittle, and completely soluble in water. 2.

Fig. 27.



Gum Senegal, from the western coast of Africa; larger fragments, darker colour, less brittle, of a conchoidal fracture. 3. *Gum Barbary*, from the northern part of Africa; has a dark colour, apt to contain impurities, less abundant than the others.—Guerin has discovered three distinct principles in gum:—1. *Arabin*—found in pure gum Arabic, and which is completely soluble in water. 2. *Bassorin*—found in Bassora gum; characterized by swelling up considerably in water, but not dissolving. 3. *Cerasin*—found in the gum of fruit trees; distinguished by being converted into arabin by the action of boiling water.

Uses.—Chiefly as a demulcent, in pectoral affections, diarrhoea, and dysentery; an ingredient in most cough mixtures; also in pharmacy, in the compounding of pills. *Mucilage* for drink is made by dissolving ʒj in Oj of water.

The *syrup* (*Syrupus Acaciæ*, U. S.), is chiefly used in pharmacy.

TRAGACANTH. (*Tragacantha*, U. S.)—Product of several species of *Astragalus*, particularly of *A. verus*,—small, thorny shrubs growing in Persia and Asia Minor. The gum exudes spontaneously. Occurs in irregular, tortuous pieces, of a dirty yellowish colour; translucent, resembling horn; hard, but difficult to pulverize; consists chiefly of *bassorin*; swells up, but does not dissolve in water,—forms with it a paste. A demulcent,—used chiefly in the preparation of troches.

SLIPPERY ELM BARK. (*Ulmus*, U. S.)—Inner bark of the *Ulmus fulva*, a large indigenous tree. It is stripped off in pieces several

feet in length, and folded longitudinally. Colour, tawny; texture, fibrous; odour, peculiar; taste, sweetish, peculiar, and mucilaginous. It is a good demulcent, and is used in dysentery, &c.; also nutritious; generally given in infusion. (*Infusum Ulmi*, U. S.) The powder may be employed by simply stirring in boiling water, and made of any thickness, and flavoured according to the taste. A poultice made from the powder forms an excellent emollient application to the inflamed skin.

FLAXSEED. (*Linum*, U. S.)—Seeds of the *Linum usitatissimum*, or common flax. They are about a line in length, oval, of a brown colour, and glossy. The cuticle abounds in mucilage; the interior contains a fixed oil, which is procured by expression, and called *Linseed oil*—much used in the arts. The mucilage is obtained by infusing the seeds in boiling water; not proper to boil them, since the oil would then be extracted, which is unpleasant to the taste;—proportions, $\frac{3j}{\text{to}}$ Oj of water, flavoured with lemon-juice and sugar;—much used in pectoral and bowel affections, and nephritic disorders. The ground seed forms with hot water an excellent emollient poultice.

IRISH MOSS. (*Chondrus*, U. S.)—Usually called *Carrageen*;—botanically, *Chondrus crispus*. It grows on the rocks on the northern coasts of Europe,—particularly Ireland; also in this continent. Consists of a flat, cartilaginous frond, several inches long, curled, and of a yellowish colour;—odour, feeble; taste, slight; insoluble in cold water, but soluble in boiling water;—contains starch, pectin, and other matters. A nutritive demulcent, used in pectoral complaints, dysentery, nephritic disorders, &c. Decoction, made by boiling $\frac{3ss}{\text{in}}$ Ojss to Oj . Made also in the form of a jelly, properly flavoured, as an article of diet.

ICELAND MOSS. (*Cetraria*, U. S.)—Botanically, *Cetraria Islandica* (*Lichen Islandicus*); grows in the northern parts of both continents,—inland. It is from 2 to 4 inches long; dry, coriaceous, and smooth; deeply channeled; of a grayish-white and brown colour; no odour; of a bitter, mucilaginous taste; soluble in boiling water. It contains a bitter principle, *Cetrarin*, which renders it slightly tonic as well as demulcent;—the bitterness may be removed by weak alkaline solutions. Used in chronic pectoral affections, attended with debility; also in chronic diarrhoea and dysentery. Decoction made by boiling $\frac{3j}{\text{in}}$ Ojss of water down to Oj .

LIQUORICE ROOT. (*Glycyrrhiza*, U. S.)—Root of the *G. glabra*, growing in the south of Europe, having a round, tough, and pliable root. As found in the shops, it is in long pieces, varying from a few lines to an inch in thickness; of a yellowish-gray colour externally; yellow within; taste, sweet and somewhat acrid. It contains a peculiar saccharine principle called *glycyrrhizin*, which differs

from sugar in not undergoing the vinous fermentation; it also contains some starch, and a resinous acrid matter. A good demuleant,—used chiefly as an adjuvant with other acrid medicines. Decoction, made with ʒj to Oj water. The powdered root used for sprinkling over pills.

Liquorice (*Extractum Glycyrrhizæ*, U. S.)—made by evaporating the decoction. The best is imported from Calabria. Comes in black, flattened cylinders, about an inch in diameter, shiny when broken; of a sweet taste;—much used in cough-mixtures and lozenges.

BARLEY. (*Hordeum*, U. S.)—Prepared for medicinal use by cleaning the grain, and rounding and polishing in a mill; it then constitutes *pearl barley*. It is in small, white, oval grains, with a dark, longitudinal furrow on one side. Consists of starch, gum, sugar, and gluten;—apt to become musty by long keeping. Virtues yielded to boiling water.

Barley Water. (*Decoctum Hordei*, U. S.)—Made by washing ʒij barley in cold water; then boil for ten minutes in a small quantity of water; throw away this water, and add Oij boiling water, and boil down to Oj ;—an excellent drink in inflammatory and febrile affections;—may be flavoured with lemon-juice and sugar.

ARROW ROOT. (*Maranta*, U. S.)—Product of the *Maranta arundinacea*, growing in the West Indies and Central America; also in Florida. The root is perennial and tuberous, and is prepared for use by first washing, then beating into a pulp, and thrown into water, and stirred, so as to separate the fecula; it is then strained through a sieve and allowed to dry. The best is imported from Bermuda. It is a white, light powder; no odour nor taste; chemically, a pure starch; often adulterated with potato starch; can only be distinguished by the microscope. A nutritious demuleant, particularly adapted to children as an article of diet, also in bowel-affections. Given, by first forming a paste with cold water, and then adding this to boiling milk or water.

The *Canna root*, or *Tous-les-mois*, is very similar to the arrow root: it comes also from the West Indies.

TAPIOCA, U. S.—Fecula prepared from the root of the *Jatropha manihot*, or *cassava plant*,—a native of the West Indies and tropical America. The root is large, fleshy, and tuberous. There are two varieties, the sweet and the bitter. The latter contains an acrid, poisonous principle; still, it is the one most cultivated for tapioca, since its poisonous principle, being volatile, is dissipated by heat. The juice being expressed from the root, deposits its starch on standing, and is then dried by exposing it to heat. It is in irregular, hard, white, rough grains, with little or no odour and taste. Prepared for use by boiling in water, which converts it into a sort of

jelly. Used exclusively as an article of diet; may be flavoured to suit the taste;—brandy or wine may be added, in cases of debility, or irritability of stomach.

SAGO, U. S.—Product of the *Sagus Rumphii*, or *sago palm*, indigenous in the East Indies, growing about 30 feet high. The sago resides in the pith of the trunk; this is agitated in water, to which it imparts its starch; this subsides, and is passed through a sieve, when the farina is deposited on standing, and then dried; this is *common sago*. It is in grains of unequal size, of a yellowish colour. The finest kind, called *pearl sago*, is refined by the Chinese; it is in small, round grains, whitish, hard, and sometimes translucent, with no odour, and a slight taste. It consists almost entirely of pure starch; insoluble in cold water; requires long boiling.—Uses and modes of preparation, the same as for tapioca.

Fig. 28.



CLASS XXIII.

DILUENTS.

MILD liquids, which dilute the contents of the stomach and bowels; and which, entering the blood-vessels, render the blood thinner, and, at the same time, dilute the secretions. Water is the only liquid, strictly speaking, which can be used for these purposes; water is, in fact, the great diluent of nature. The additions which are usually made, are for the purpose of imparting flavour, or rendering it more nutritive. Diluents are useful in inflammatory diseases,—in cases of acrid poisons,—as adjuvants to emetics, &c., also to restore a proper degree of fluidity to the blood. The demulcents form the best diluent drinks.

CLASS XXIV.

ANTACIDS.

MEDICINES which combine with, and neutralize acids. Their action is entirely chemical. Although all salifiable bases are antacids, the only ones employed remedially are the alkalies, alkaline earths, and alkaline carbonates. They do good by removing excess of acid in the stomach and bowels, which is frequently the cause of disease, as colic, diarrhœa, &c. They are also useful in the uric acid diathesis, where there is a tendency to gout, and gravel.

MAGNESIA.—One of the most valuable of the antacids;—very powerful, in consequence of its low combining number; used extensively in the colics, and diarrhœas of children, either alone, or combined with rhubarb or calomel; also in sick headaches, gout, and gravel. Dose, gr. x to ʒj.—The *carbonate* is given in double the dose.

CARBONATE OF SODA. (*Sodæ Carbonas*, U. S.)—Procured from the ashes of sea-weeds, in the impure forms of *kelp* and *barilla*; generally manufactured from the sulphate, by decomposing it with carbonate of lime. It is in large, rhomboidal crystals, efflorescent, very soluble in water; taste, alkaline; unequal in strength. Dose, 20 to 30 grs.;—of the dried salt, 5 to 10 grs.

BICARBONATE OF SODA. (*Sodæ Bicarbonas*, U. S.)—*Supercarbonate of Soda*.—Prepared by passing carbonic acid gas through a solution of the carbonate, and crystallizing at a low heat. Usually occurs as a white powder, and contains some sesquicarbonate;—not so soluble as the carbonate, but less disagreeable to the taste. Given in dyspepsia, &c.; also used in making soda and Seidlitz powders.—Dose, gr. 10 to ʒj.

CARBONATES OF POTASSA.—Already spoken of under *Diuretics*. As antacids, the *carbonate* is given in the dose of 10 to 20 grains; the *bicarbonate*, in from 20 to 40 grains.—The *infusion of hickory ashes* is sometimes used as an antacid: it owes its efficacy to the carbonate of potassa which it contains.

Liquor Potassæ, U. S.—Solution of Potassa is an excellent antacid in the diarrhœas of children; also in dyspepsia, used with bitters.

LIME. (*Calx*, U. S.)—Used medicinally only in solution, under the name of *lime-water* (*Liquor Calcis*, U. S.);—made by dis-

solving lime in water, and keeping it in well-stopped bottles, with a portion of lime undissolved, in order that it may be always saturated. It is colourless, of an alkaline taste and reaction; combines with the carbonic acid of the air, and forms a pellicle of the carbonate. Used generally in combination with fresh milk, as a remedy for irritable stomach,—a tablespoonful of each, taken every half hour. Externally, in combination with linseed oil, as a liniment for burns.

The *carbonate* is used internally in the form of *prepared chalk*, and *prepared oyster-shells*. Prepared chalk (*Creta Præparata*, U. S.), occurs in the form of small, white, conical masses, insoluble in pure water, somewhat soluble in carbonic-acid-water. It is astringent as well as antacid, and is very useful in diarrhœas accompanied by acidity—particularly in children; dose, 5 to 20 grains, every hour or two. The *Chalk mixture* (*Misturæ Cretæ*), is made by rubbing up chalk with sugar and gum, and adding cinnamon-water. —Chalk is sometimes applied externally as an absorbent.

Prepared oyster-shells (*Testa Præparata*, U. S.), are made from the common shells by grinding, &c., as for prepared chalk. They differ from it only in containing a little animal matter.

Uses.—The same.

The *precipitated carbonate* (*Calci Carbonas Præcipitatus*, U. S.), is made by the reaction of carbonate of soda on a solution of chloride of calcium. It is a fine, white powder.

AMMONIA.—A stimulant antacid, given in aqueous or alcoholic solution. The *Liquor Ammonix* and the *Spiritus Ammonix* are seldom used internally, in the undiluted form. The *Spiritus Ammonix Aromaticus* is an excellent stimulant in languors, faintings, flatulent colic, &c. *Carbonate of ammonia* is also antacid.

CLASS XXV.

ANTHELMINTICS.

MEDICINES which destroy, or expel worms from the alimentary canal. Some act by a direct poisonous influence upon the worms, causing their death; others, by a purely mechanical method; others, again—as the drastic cathartics—through the increased amount of mucous exhalation produced.

PINK ROOT. (*Spigelia*, U. S.)—Product of *Spigelia Marilandica*, an indigenous, herbaceous perennial, growing in the Southern

States. The root is the officinal part. It consists of numerous branching, wrinkled fibres, attached to a caudex; colour, brownish-yellow externally; odour, faint; taste, sweetish and bitter. It contains

Fig. 29.



a fixed oil, and a peculiar bitter extractive, which is the active principle, and some others. Large doses are cathartic and sometimes narcotic. It ranks high as an anthelmintic, destroying the worms. Given in powder and decoction; dose of powder for a child two to four years old, 10 to 20 grains; often combined with calomel. The infusion (*Infus. Spigeliæ*, U. S.) made with ℥ss to Oj . Often combined with senna, to insure its purgative effect. The *Extractum Spigeliæ et Sennæ Fluidum*, U. S., is an excellent preparation; dose, f℥j-ij .

WORMSEED. (*Chenopodium*, U. S.)—Seed of the *C. anthelminticum*, or Jerusalem oak, and also of *C. ambrosioides*, indigenous perennial plants, growing throughout the United States. The seeds are about the size of a pin's head; of a greenish-yellow colour, pungent taste, and a peculiar aromatic odour; virtues depend on a volatile oil. They are an excellent anthelmintic; peculiarly adapted to expel the lumbrici of children; best given as an electuary with molasses; to be administered for several successive days,

and then followed by a cathartic; dose, ℞j-ij . The oil is of a light yellow colour, grows darker by time; given in the dose of 5 to 20 drops.

→ **POMEGRANATE BARK.** (*Granati Radicis Cortex*, U. S.)—The bark of the pomegranate root is powerfully anthelmintic; useful in the expulsion of the *tape-worm*; best given in decoction made by boiling ℥ij in Oij water, down to Oj; dose, one third, to be taken every half hour.

PRIDE OF CHINA. (*Azederach*, U. S.)—Bark of the root of the *Melia Azederach*, a beautiful tree, growing in the Southern States. The bark is most powerful in the fresh state; taste, bitter and nauseous. In full doses, it is emeto-cathartic; overdoses are narcotic. Best given in decoction, repeated for several days, and then followed by a cathartic.

MALE FERN. (*Filix Mas*, U. S.)—Root of the *Aspidium Filix Mas*, growing in Europe and North America. The root is long, cylindrical, and flexible, covered over with the remains of the leafstalks. As found in the shops, it is very apt to be deteriorated. Colour, externally, brown; odour, feeble, but peculiar; taste, astringent and nauseous. It is slightly tonic, and very astringent; also anthelmintic; used to expel the *tape-worm*. Not much used at present. Dose of powder, ℥j to ℥iij; of the oil, 30 to 40 drops; of the ethereal extract, gr. x-xx.

COWHAGE. (*Mucuna*, U. S.)—Legumes or pods of the *M. pruriens*, a climbing West India plant. The pod is about four inches long, shaped like an *Italic f*, covered over with brown, bristly hairs, which easily separate when handled, and produce intense itching. Used by steeping the pods in molasses or honey, and then scraping off with a knife. It acts as an anthelmintic in a mechanical manner,—the spiculæ, adhering to the worms, causing them to loose their hold on the intestine. Dose, of the electuary, a teaspoonful to a tablespoonful, to be given for several successive mornings, and then followed by a cathartic.

OIL OF TURPENTINE.—Powerfully anthelmintic in large doses; particularly useful in expelling *tænia*; its purgative operation must be always insured by combining it with, or following it by castor oil. Dose, f℥j to f℥ij. In smaller doses, it is very efficacious in removing the *ascarides* of children, to whom it may be given in combination with castor oil, or else by enema.

TIN. (*Stannum*, U. S.)—Used in the form of powder, which is prepared by melting tin, stirring while cooling, and then passing through a sieve; believed to act mechanically; used chiefly to expel *lumbri*ci, and *tænia*. Dose, ℥j to ℥ij, repeated, and then followed by a brisk cathartic.

CALOMEL.—An excellent anthelmintic for children ; best administered by giving a grain or two every night, or every other night, and following, in the morning, with a dose of castor oil and oil of turpentine. It, no doubt, acts through the agency of the bile which is poured out.

THE END.



